

QST

December 1954

40 Cents

45c in Canada

amateur radio



Season's
Greetings
to All

H. R. Hick

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

THE STANDARD OF COMPARISON FOR OVER 20 YEARS

HIGH FIDELITY TRANSFORMERS

FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.

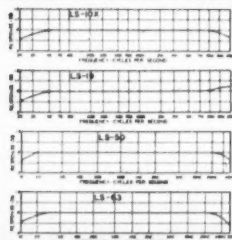


TYPICAL UNITS

LINEAR STANDARD series
Linear Standard units represent the same from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. All units have a guaranteed response within 1db. from 20 to 20,000 cycles.

Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup.

These are the finest high fidelity transformers in the world. 65 stock types from milliwatts to kilowatts.



LS-10X Shielded Input
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms ... multiple shielded.

LS-19 Plate to Two Grids
Primary 15,000 ohms.
Secondary 95,000 ohms C.T.

LS-50 Plate to Line
15,000 ohms to multiple line ... +15 db. level.

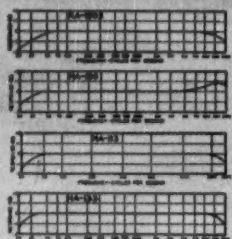
LS-63 P.P. Plates to Voice Coil
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, MLF, ul-linear circuits.
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



CASE LS-1 LS-2 LS-3
Length 3 1/4" 4 7/16" 5 13/16"
Width 2 1/8" 3 1/2" 5"
Height 3 1/4" 4 3/16" 4 11/16"
Unit Wt. 3 lbs. 7.5 lbs. 15 lbs.

HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



HA-100X Shielded Input
Multiple line to 60,000 ohm grid ... tri-alloy shielding for low hum pickup.

HA-100 Plate to Two Grids
15,000 ohms to 135,000 ohms in two sections ... +12 db. level.

HA-113 Plate to Line
15,000 ohms to multiple line ... +12 db. level ... 0 db. DC in primary.

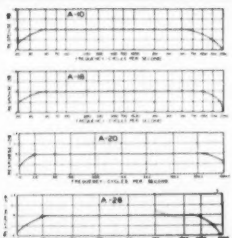
HA-123 Plate (DC) to Line
15,000 ohms to multiple line ... +15 db. level ... 0 Ma. DC in primary.



CASE HA-1 HA-2
Length 2 1/8" 3 1/8"
Width 1 13/16" 2 1/8"
Height 2 1/8" 2 1/8"
Unit Weight 2 lbs. 5 lbs.

ULTRA COMPACT series

UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.

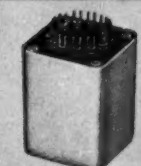


A-10 Line to Grid
Multiple line to 50,000 ohm grid.

A-18 Plate to Two Grids
15,000 ohms to 80,000 ohms, primary and secondary both split.

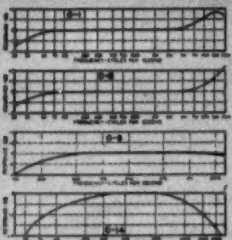
A-20 Mixing Transformer
Multiple line to multiple line for mixing mikes, lines, etc.

A-26 P.P. Plates to Line
30,000 ohms plate to plate, to multiple line.



A CASE
Length 1 1/4"
Width 1 1/8"
Height 2"
Unit Weight 1/2 lb.

DUNCAN series
UTC Duncan units are ideal for portable, concealed service, and similar applications. These units are extremely compact ... fully in requested and sealed in a drum housing. Most types provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in taps. The D-14 is a new line to grid transformer using two heavy gauge hipermalloy shields for high hum shielding.



D-1 Line to Grid
Primary 50, 250/250, 500/500 ohms to 50,000 ohm grid.

D-2 Plate to Two Grids
15,000 ohms to 95,000 ohms C.T.

D-3 Plate (DC) to Line
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.

D-14 0h. 1 Line to Grid
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



DUNCAN CASE
Diameter 7/8"
Height 1 1/3/16"
Unit Weight 1 oz.

UNITED TRANSFORMER CO.

150 Varick Street, New York 13, N. Y. EXPORT DIVISION: 13 E. 40th St., New York 16, N. Y. CABLES: "ARLAB"

G-E TUBE QUALITY SHOWS IN SUPERIOR DESIGN DETAILS

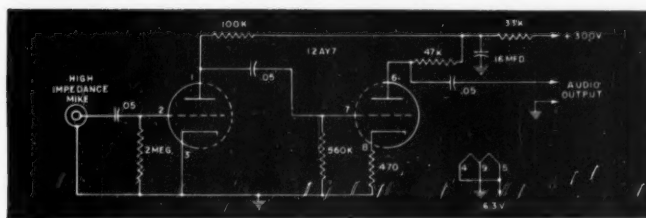
THEY'RE special, the 4 slots that G.E. puts in the mica spacers of 12AY7 twin triodes. The slots act as barriers to plate-to-grid leakage, which can cause that baneful "egg-frying" noise in audio amplification.

You get a quiet tube in the 12AY7 because G-E designers made sure that every part is engineered for low microphonics. As with all General Electric tubes, 12AY7 high quality isn't merely determined by tests—instead, it starts at the drawing-board, is a product of many G-E design features that join to assure optimum performance.

See the 12AY7 at your G-E tube distributor's!
Buy G-E tubes for every ham requirement!
You can be sure your needs will be met by efficient types *designed-in-detail* for their jobs!
*Tube Department, General Electric Company,
Schenectady 5, New York.*

EXAMPLE:

12AY7 mica
spacers are slotted
against plate-to-
grid leakage.



● Low noise level of G.E.'s 12AY7 enables this 2-stage amplifier to boost speech input with a minimum of hum and hiss. Build the device on a turret-type socket . . . it will take up only 1 square inch chassis space!

CQ...CQ... Have you nominated your Edison Award candidate?

Letters must be postmarked not later than January 3, 1955. If you haven't selected your candidate, please do so soon—then prepare and mail in your nominating letter.

Instructions were given on this page in September. Trophy, gift, and national acclaim will go to the amateur who has rendered outstanding public service in 1954!

GENERAL  **ELECTRIC**

166-186

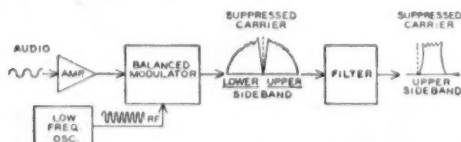
ENGINEERING NOTES

GENERATING SSB SIGNALS



The actual generation of the single sideband signal is perhaps the most important part of a SSB transmitter. In designing this part of the circuit, careful consideration should be given to the band width of the signal generated. Without careful design, this band width can be much greater than would be expected and can cause considerable adjacent channel interference on both sides of the desired signal. The most desirable performance characteristics of an SSB generator would be the ability to generate the desired sideband, completely suppress the undesired sideband and suppress the carrier. Practical design permits suppressing the undesired sideband and carrier by more than 40 db. Following is a discussion of one way that these performance characteristics may be obtained.

The block diagram below shows a "filter" type single sideband generator.



It shows how the audio and RF signals are combined in the balanced modulator and how the filter removes one sideband. If the balanced modulator is properly adjusted, the carrier can be reduced 40 db or more. Care must be taken in the design of any balanced modulator in order to prevent the RF output from coupling around the balanced modulator and being re-inserted in a later stage. This undesired coupling can be caused by stray capacitive coupling or by coupling through common power leads. Unwanted coupling around the balanced modulator will not allow complete suppression of the carrier.

The output of the balanced modulator contains

both sidebands and has the RF carrier suppressed. All the modulation components passed by the audio amplifier will appear as sidebands in the output of the balanced modulator. In order to limit the transmitted bandwidth to only that required for a satisfactory communications circuit, it is necessary to restrict the passband at some point in the transmitter circuitry. This is most easily done by the filter following the balanced modulator. This filter is required to do several things. (1) It should pass the desired sideband. (2) It should limit the bandwidth of the desired sideband to that required for an intelligible communications circuit. (3) It should provide adequate suppression to the undesired sideband. (4) It should provide some attenuation to the carrier frequency. The Collins Mechanical Filter Type 455C-31 will satisfy the above requirements. It provides a transmitted bandwidth of 3100 cps. It does not require the use of any additional audio bandpass filters. It provides at least 60 db of attenuation to the undesired sideband. No manual adjustments are required to maintain this attenuation. It will provide between 12 and 18 db of attenuation to the carrier frequency, thereby reducing the requirement for a high degree of carrier balance in the balanced modulator.

The principal advantages of the filter type single sideband generator are its ability to maintain its performance characteristics indefinitely; there are no controls, such as the critical ones required by some systems for RF and audio phasing, to get out of adjustment, and there are no critical phase shifting or audio bandpass networks required. Optimum performance can be easily provided with a Mechanical Filter exciter. When operating SSSC, we should make sure that we are utilizing the advantages offered by the system and that we are operating with a single sideband, with the carrier suppressed.

COLLINS RADIO COMPANY • Cedar Rapids, Iowa

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DALLAS 2

2700 W. Olive Ave.
BURBANK

COLLINS RADIO CO. OF CANADA, LTD., 74 Sparks Street, OTTAWA, ONTARIO



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INDUSTRIAL ARTS INDEX

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—CONTENTS—

TECHNICAL —

120 Watts of Audio Without Driving Power	
George Grammer, WIDF	15
Dual Regulated General-Purpose Power Supply	
Vincent W. Hansen, W5RVD	20
A Thyatron-Controlled Electronic Key	
Jack D. Gallagher, WSHZB	24
Using the B.F.O. as an Interpolation Oscillator	
R. R. Campbell, W4DFR	31
Double-Conversion Attachment for	
2-Meter Receivers.....M. K. Bretzfelder, W2JPX	32
Simple Crystal-Controlled Converters	
W. W. Deane, W6RET/KR6MO	34
Notes on Grounded-Grid R.F. Power Amplifiers	
T. H. Puckett, WSIXM/1	36
The 500-W Power Amplifier.....(Recent Equipment)	40

BEGINNER —

40 Watts on the 7- and 21-Mc. Bands	
Lewis G. McCoy, WIICP	11
Technician Rig for 220 and 420 Mc.	
Mason P. Southworth, WIVLH	27

OPERATING —

Results, Eighteenth ARRL Field Day	
Phil Simmons, WIZDP	42
The Novice Round-up.....	51
DX Century Club Roster.....	60

GENERAL —

"It Seems to Us....."	9	United States Naval Reserve....	62
Our Cover.....	10	How's DX?.....	63
In QST 25 Years Ago.....	10	The World Above 80 Mc.....	67
Military Affiliate Radio System	35	Operating News.....	70
Hints & Kinks.....	39	With the AREC.....	74
Happenings of the Month.....	52	Station Activities.....	77
YL News and Views.....	54	Silent Keys.....	142
On the TVI Front.....	57	Feed-Back.....	146
I.A.R.U. News.....	58	Hamfest Calendar.....	188
Correspondence from Members.	59	QST Index for 1954.....	164

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (or preceding month) directly to the S.C.M. (the administrative ARRL officer elected by members in each Section). Radio club reports are also desired by S.C.M.s for inclusion in the **ARRL Field Organization station appointments** available in the areas shown to qualified League members. These include GRS, OES, OF, OO and OB. For more information, see applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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Dakota Division

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1012 South Willow Ave., Sioux Falls, S. D.
Vice-Director: Forrest Bryant W0FDS
6840 Harriet Ave., Minneapolis, Minn.

Delta Division

GEORGE H. STLED W5BUX
1912 Beech St., Pine Bluff, Ark.
Vice-Director: George S. Acton W5BMM
Plain Dealing, La.

Great Lakes Division

JOHN H. BRAHBI W8SPF
708 Ford Bldg., Detroit 26, Mich.
Vice-Director: Robert L. Davis W8EYE
247 Highland Ave., Salem, Ohio

Hudson Division

GEORGE V. COOKE, JR. W2OBU
88-31 239 St., Bellerose 26, N. Y.
Vice-Director: Thomas J. Ryan, Jr. W2NKD
1082 Anna St., Elizabeth 4, N. J.

Midwest Division

WILLIAM J. SCHMIDT W0GZN
306 S. Vassar, Wichita, Kansas
Vice-Director: James F. McKim W0MVG
1404 S. Tenth, Salina, Kansas

New England Division

PERCY C. NOBLE W1BVR
37 Broad St., Westfield, Mass.
Vice-Director: Frank L. Baker, Jr. W1ALP
91 Atlantic St., North Quincy 71, Mass.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.
Vice-Director: Karl W. Weingarten W7BG
3219 N. 24th St., Tacoma 7, Wash.

Pacific Division

RAY H. CORNELL W6JZ
909 Curtis St., Albany 6, Calif.
Vice-Director: Harry M. Englehart W6HC
770 Chapman, San Jose 26, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.
Vice-Director: Gus M. Browning W4BPD
135 Broughton St., S. E., Orangeburg, S. C.

Rocky Mountain Division

CLAUDE M. MAIER, JR. W0IC
740 Lafayette St., Denver, Colo.
Vice-Director:

Southeastern Division

JAMES P. BORN, JR. W4ZD
25 First Ave., N. E., Atlanta, Ga.
Vice-Director: Randall E. Smith W4DQA
902 Plaza Court, Orlando, Fla.

Southwestern Division

JOHN R. GRIGGS W6KW
3661 Buckingham Rd., Los Angeles 8, Calif.
Vice-Director: Walter R. Joos W6EKM
1315 N. Overhill Drive, Inglewood 3, Calif.

West Gulf Division

A. DAVID MIDDLETON W5CA
9 Kay Road, Tjeras, N. M.
Vice-Director: Carl C. Drumeller W5EHC
5824 N.W. 38th St., Oklahoma City 12, Okla.

"It Seems to Us..."

TECHNICIAN PRIVILEGES

By decision of the ARRL Board of Directors, the League has filed with the Federal Communications Commission an endorsement of its proposal to open the 50-Mc. band to Technicians, and opposition to its proposal to open the 144-Mc. band to those licensees. Our correspondence indicates a lack of understanding on the part of many amateurs as to why the League has assumed what appears to them to be contradictory viewpoints.

We think the difficulty arises from a misunderstanding of the Board's basic objective in this whole matter. The objective is increased occupancy of the 50-Mc. band — especially by newcomers. Two years ago the Board, in the course of its annual survey of our affairs, noted with concern a decreasing interest on the part of newcomers in the 50-Mc. band, potentially one of our most valuable. At that time, in an endeavor to correct the situation, the Board voted to ask FCC to permit Novice licensees to operate on 50 Mc., in addition to the other Novice bands. It was hoped this would result in the desired newcomer interest in a mighty fine, but lately neglected, segment of our amateur territory.

However, this year FCC turned down this proposal, basing its decision largely on concern that because of the adjacency of the band to TV channels, serious TVI problems might result, inasmuch as FCC felt the Novice could not be expected to have experience and technique to cope successfully with such problems. The problem of 50-Mc. occupancy still remains, however, and continues very much in the minds of many amateurs, both on the Board and in the field. Recently, as a result of suggestions by Directors Crossley and Middleton, based on a petition filed with FCC by W5FXN, the Executive Committee carefully examined the possibility of the League also proposing to FCC the opening of the 50-Mc. band to Technicians, on the basis the Technician licensee meets the standards which FCC had indicated it felt the Novice did not. Again, the objective was primarily one of increased occupancy of that band, and the League agreed the proposal was a wise one in the long-term interests of the amateur service. During this process FCC separately initiated action on the W5FXN petition. The League's

established view, then, was in support of the Commission proposal.

But the Commission additionally proposed that 144 Mc. be also opened to Technicians. This matter the Executive Committee then also examined carefully. The Committee could not agree to the Commission's supporting statement that "The Technician's value to, and participation in, civil defense communications through the Radio Amateur Civil Emergency Service would be considerably enhanced. . . ." This is for the reason that under the rules Technicians holding RACES permits can *already* operate in the 50-Mc. civil defense segments (or such segments on any amateur band), under RACES licensing. The Commission's proposal therefore does not appear to offer any practical advantage over present rules in extending the privileges of Technicians for civil defense participation.

More important, it was felt that opening 144 Mc. to Technicians would completely negate the action in opening 50 Mc. for their use. If both proposals are adopted, where will the Technicians drift? Why to 144 Mc., of course, where there is considerably greater occupancy and considerably greater variety of available equipment, both ready-made and surplus. There are on 144 Mc. more people to talk with, and the gear for that band is a simpler matter. (Under the same circumstances, isn't that where *you* would go?)

The fact is that the League's aim in proposing 50 Mc. for Technicians, and in opposing 144 Mc., is to accomplish, by regulation, greater occupancy of the 6-meter band. Amateurs of other classes simply have not made anywhere near as much use of 50 Mc. as can be made. While the League and QST have used every means we can think of to promote and encourage occupancy there, it hasn't worked out to the extent it should in our long-term interests. Particularly since the advent of the Novice Class license, which allows the newcomer to use part of the 144-Mc. band, use of 50 Mc. has been declining steadily. This, we believe, is largely due to the absence of beginners on the lower frequency. Thousands of Novices have broken into the game on 144 Mc. When they graduate to General Class the great majority of them stick with 144 Mc. for their v.h.f. work. To maintain its position, or to

develop more occupancy, any band must have a steady influx of beginners. The 50-Mc. band has gotten almost no new blood in the last few years. To open it to Technicians would almost surely help correct this situation.

For these reasons, then, the League view is that Technicians should be permitted on 50-Mc., as a means of obtaining greater occupancy and contributing to knowledge of propagation techniques at that order of frequency, but that Technicians should not be permitted simultaneous use of 144 Mc. because it would completely nullify the primary 50-Mc. objective.

OUR COVER

Almost four decades of good-fellowship has been written into the logs of amateur stations around the world since Harry R. Hick, 1E8SS, a young but enterprising "spark" ham, created the cover design for May, 1916, *QST* (see reproduction on page 42 of our October, 1954, issue). Since that time, "HRH" has been *QST*'s senior draftsman and illustrator. We think it especially fitting, therefore, that during this holiday season Harry once more give of his talents, to help all of us at Hq. wish all of you . . .

A VERY MERRY CHRISTMAS!



December 1929

... *QST* now is fourteen years old and ARRL President Maxim's editorial looks back over the bustling years as well as forward to a bright future for amateur radio.

... "The Single-Control Transmitter," by George Grammer, is an encouragingly simple and effective one-tube set employing the Type UX-210.

... Incorporating several new and novel ideas, "The Receiver at WIAOF," by H. C. Wing and *QST* Assistant Editor Clark C. Rodimon, is of universal interest.

... Paul C. Osanyan, jr., gives details on his observations of "Arctic Auroral Radio Interference" made while on an expedition to Greenland in 1927-1928.

... The UY-227 as a detector, push-pull antennas, a capacity bridge, and r.f.-choke notes are subjects that make up an interesting Experimenters' Section.

... The East Orange, N. J., station of D. C. Akers, W2FL, is featured in the last of a *QST* series depicting up-to-date amateur station installations.

... ARRL Secretary Warner defines the scope and activities of the newly formed international technical consulting committee in "The Amateur and the C.C.I.R."

... "Amateur Radio and the National Air Races," by Harry A. Tunmonds, WB4AH, acknowledges hamdom's contribution to the recent Cleveland classic's success.

... WIAOZ's closing station was the occasion for "Seventy-One Rounds," a farewell-party rag chew which lasted thirteen hours and included 71 stations.

... "Coming Operating Activities," enumerated by F. E. Handy, includes announcements of two upcoming international message-handling societies.

... In addition to overseas societies reports, in *IARU* News we find G6ZR's interesting tabulation of "best times" for Europe-U. S. A. 20- and 40-meter QSOs.

... Among the usual voluminous information to be found in Communications Department pages is a listing of reported "high-quality" and "prehistoric" signals heard.

Strays

During the November elections, New York City members of the V.H.F. Teletype Society once more established amateur radioteletype circuits to report New York State election returns to broadcast station WNYC. Reports from up-state counties were relayed on 80 meters via W2EFU, W2BO, W2BTY, K2AVK, W2AEE, W2SZ, W2JNM, W2SRB and K2DVC, the network organization of Vin Kenney, W2BGO, communications officer, New York State Civil Defense. Repeating this information on tape at the control center and retransmitting immediately to the radioteletype printers in the New York Municipal Building, via a 2-meter link, were operators W2QGH, W2VVP, W2LYZ, and W2BGO. Operators W2AKE and W2BFD handled the WNYC end. In spite of difficult 80-meter conditions and snowstorms upstate, there was such expeditious handling of the returns that all amateurs participating were warmly thanked by officials for the good service provided.

SINCE the war many countries of the world have set up currency restrictions which either prohibit the sending of money outside their boundaries or make it practically impossible. This has meant that hundreds of amateurs in other lands do not normally have the opportunity to renew their ARRL memberships and receive *QST* regularly. The situation is made more acute by the devaluation of many foreign currencies, for many of those who formerly were just barely able to get together the necessary American dollars now find it utterly impossible to do so.

At the end of the war ARRL did in numerous instances grant membership and *QST* to prewar members overseas on a credit basis, but of course we couldn't carry membership-subscriptions on that basis indefinitely and, in practically all cases, we have been regretfully obliged to discontinue these arrangements. It occurs to us that perhaps American amateurs and club groups might again this year wish to make a "care" package gift in the form of *QST* for Christmas, as many have done regularly in recent years. If it's something you'd like to do, we'll be glad to make necessary arrangements. The foreign membership dues are \$5. If you have a particular DX buddy in mind, give us his name — and complete address. If you have no special name, we can arrange to apply your remittance to a membership-subscription for a foreign amateur who cannot send his own money but wishes to renew. We'll let you know what amateur we select. And of course we'll send the recipient of your gift an appropriate note to tell him who his American patron is. Address ARRL, 38 La Salle Road, West Hartford 7, Connecticut.

40 Watts on the 7- and 21-Mc. Bands

A Two-Band Rig with a Two-Band Antenna

BY LEWIS G. McCOY,* WHCP

• A simple 7- and 21-Mc. combination makes real good sense for the Novice when it is combined with a two-band antenna for the same range. Here is a 40-watt transmitter for these two bands, using inexpensive components and a method of construction that should avoid any TVI troubles.

THE problem of TVI is not usually very serious when one is operating in the 3.5- and 7-Mc. bands, but on any of the higher bands it cannot be disregarded except in a few rare cases. Anyone planning to operate in the 21-Mc. band should realize that the 3rd and 4th harmonics from his transmitter fall in Channels 3 and 6, respectively. The transmitter should be enclosed in a shielded box to keep these harmonics from being radiated. The transmitter described here is built on a chassis bottom plate, and the chassis proper is used as a shielding case. This is an extremely simple method of construction and affords easy access to all of the parts.

As indicated by the title of the article, the transmitter operates on the 40- and 15-meter bands. An output circuit is provided that will work into any low-impedance line or into an antenna coupler, but we recommend using a half-wave 7-Mc. antenna fed with coaxial line. The transmitter will work nicely into this antenna

system on either 7 or 21 Mc., without any additional coupling circuits.

The Circuit

The circuit diagram of the transmitter is shown in Fig. 1. A 6CL6 grid-plate type oscillator drives a 6BQ6-GA amplifier. Either 80- or 40-meter crystals can be used in the oscillator. If 3.5-Mc. crystals are used for 21-Mc. operation, the oscillator output will be on 7 Mc. and the amplifier must triple in frequency to give output in the 21-Mc. band. This will result in considerably less output than if 7-Mc. crystals were used and the tripling took place in the oscillator. However, it should be pointed out that excellent contacts can be made with low power when the band is "open."

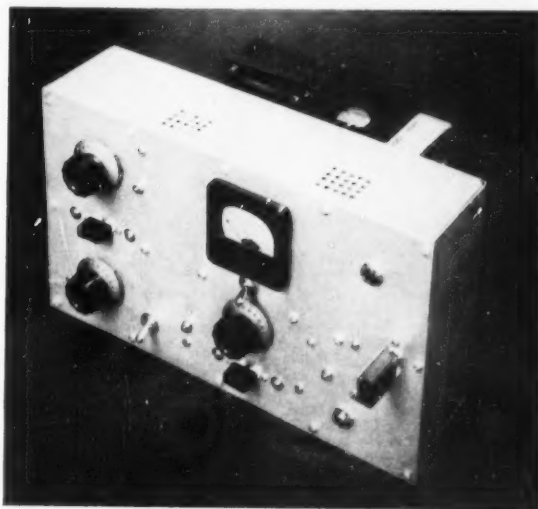
To change bands from 7 to 21 Mc., turns on the oscillator plate coil and the amplifier plate coil are shorted out by small jumper plugs.

A 0-1 milliammeter is connected as a voltmeter and the grid and cathode currents of the 6BQ6-GA are checked by measuring the voltage drop across R_4 in the grid circuit and R_5 in the cathode circuit. The double-pole double-throw toggle switch, S_1 , is used to switch the meter to either circuit. When R_4 is in the meter circuit, the full scale reading is approximately 10 ma.; when R_5 is switched in, full scale reading is about 200 ma.

In addition to the shielding, extra TVI precautions were taken by installing C_{19} and C_{20} to by-pass the power supply leads and C_4 at the key jack to by-pass the key leads. On-the-air tests

* Technical Assistant, QST.

Front view of the complete unit. The black squares between the two knobs on the left and below the knob in the center are the shorting plugs used in the 21-Mc. position. Note the holes in the top and side of the chassis box that furnish the necessary ventilation for the rig. The power supply is on a separate chassis bolted to the rear wall of the r.f. unit.



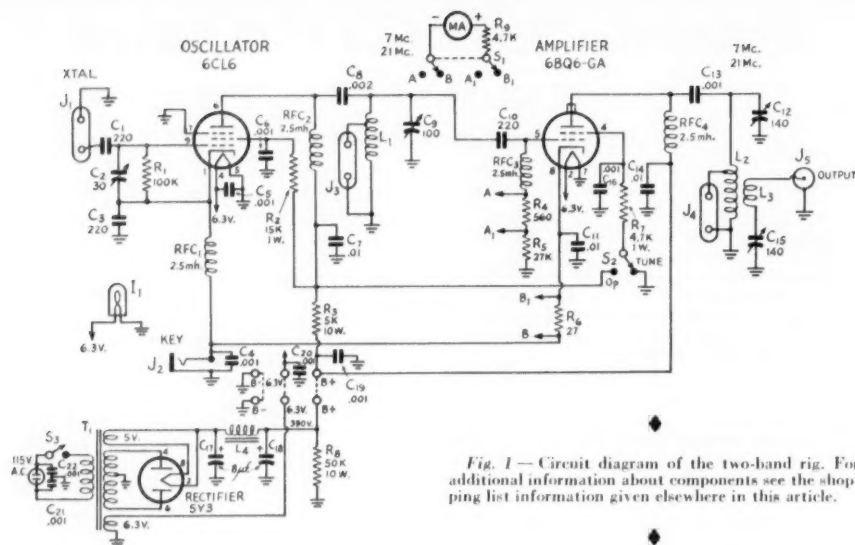


Fig. 1—Circuit diagram of the two-band rig. For additional information about components see the shopping list information given elsewhere in this article.

showed that these precautions were sufficient for even weak-signal areas.

A single-pole double-throw switch, S_2 , is used to ground the screen of the amplifier tube during tune up, protecting the tube against damage.

Construction

It may be that local suppliers don't stock aluminum bottom plates. If such is the case, most of the larger mail-order houses carry them as regular stock. Another source is a local sheet-metal dealer. A 7 × 12-inch aluminum plate is obtainable for less than one dollar.

The various components are laid out on the plate as shown in the photograph. There is nothing

critical about the layout, but remember to provide a half inch of clearance around the edge so that the completed unit will fit into the chassis box. Mounting holes for the tube socket brackets should be measured with the tubes in the sockets to take care of the clearance problem.

The 3/4-inch stand-offs that support the coils are mounted exactly two inches apart. The crystal sockets, J_3 and J_4 , which accommodate the 300-ohm line shorting plugs, are mounted between the coil stand-offs.

Four holes, large enough to take No. 6 sheet-metal screws, are drilled at the four corners of the plate and in the chassis box. In areas where one is likely to encounter TVI, the plate should be fastened to the box with screws set not more than three inches apart, to insure tight shielding.

The power supply is mounted on a 3 × 5 × 7-inch chassis which can be bolted to the back of the chassis box. Leads from the power supply are brought through the box wall to a two-terminal tie point.

Wiring

The power supply is wired first. In the supply shown in the photographs, the transformer power leads come off the bottom of the transformer. A 1/2-inch hole will be large enough to pass all the leads. The two by-pass condensers, C_{21} and C_{22} , should be mounted at the point where the 115-volt a.c. line enters the supply. Two leads are brought through the side of the power supply chassis to a two-terminal tie point mounted inside the chassis box. One lead is the B-plus and the other the "hot" side of the 6.3-volt heater line. Both of these leads are by-passed to chassis ground at the two-terminal tie point by C_{19} and C_{20} . B-minus and the other side of the 6.3-volt line is the common ground connection obtained

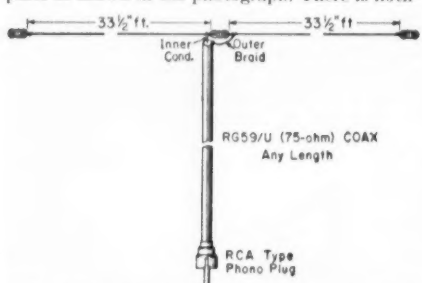


Fig. 2—Drawing of a coax-fed 7-Mc. dipole antenna. The 67-foot length is figured from end to end. The two or three inches of wire needed to secure the antenna to the insulators is negligible in the over-all performance of the antenna. The end of the coax that attaches to the center of the antenna is made up by separating the outer braid from the inner conductor, far enough back to allow connections to the center insulator. The point where the braid enters coax covering should be weatherproofed by using black vinyl electrician's tape. Ordinary friction tape can be used but the joint should be coated with Glyptol or fingernail polish. An RCA phono plug is used at the transmitter end of the coax.

by bolting the two chassis together. However, three leads are brought from the two-terminal tie point to the transmitter bottom plate, the B-plus leads, the 6.3-volt lead, and a ground lead which connects the chassis box to the plate.

After the heater and dial light circuit is wired, the rest of the transmitter, starting with the oscillator circuits, is wired.

The oscillator and amplifier plate coils, L_1 and L_2 , consist of 22 turns of Barker & Williamson No. 3015 Miniductor stock. These coils are available in three-inch lengths and one length will be sufficient for both L_1 and L_2 . L_3 , the output link, is 24 turns of No. 3011 Miniductor stock.

The coils L_1 and L_2 are mounted in the following manner: A coating of Duco cement is applied to the ends of one of the coils' insulating strips. A soldering lug is then laid in the cement, with the large hole of the lug beyond the end of the insulating strip. The cement is allowed to dry and then another coat is applied.

The coils can then be mounted with $\frac{1}{4}$ -inch 6-32 screws on the $\frac{1}{4}$ -inch stand-offs. The oscillator plate coil is tapped down 4 turns from one end. The 3rd and 5th turns are bent in to allow access to the 4th turn. The tap is connected to one side of the two-prong socket and the other side of the socket is grounded. The same procedure is followed with L_2 except that the tap is on the 6th turn. The 300-ohm line plugs are used for shorting the unused sections of the coils when operating on 21 Mc. The plugs are made up by simply inserting

a piece of bare wire through one pin of the plug and out the other and then soldering.

The link L_3 is slid inside L_2 and held in place by a small piece of cardboard or paper. Be sure

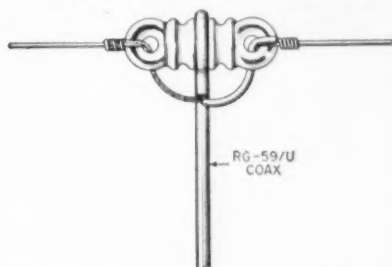


Fig. 3 — This drawing shows the method of connecting and supporting the coax at the center of the antenna. Because of the weight of the feed line, the coax should be looped over the insulator and then taped. This will take the strain off the conductors. The outer conductor should be separated from the inner conductor for a length of several inches. This will provide enough length for a drip loop.

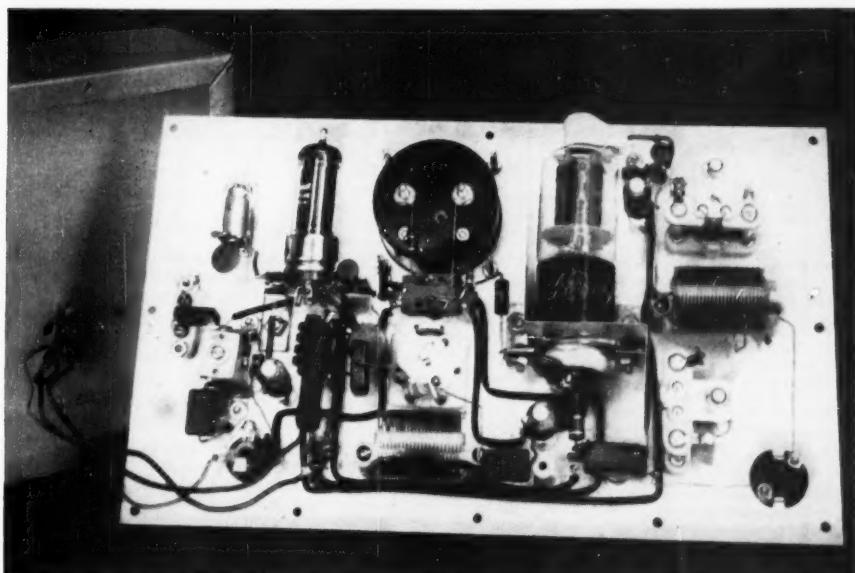
that the link is positioned so that it doesn't short to L_2 .

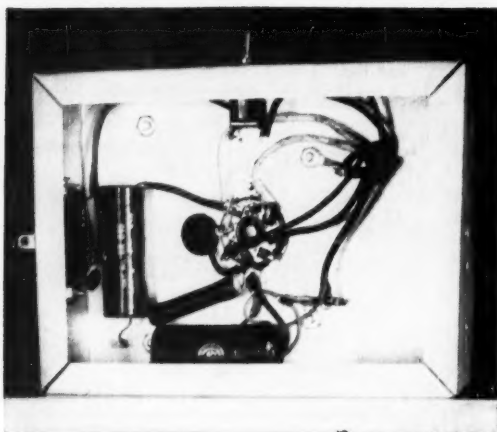
Operation

Before turning the transmitter on, carefully check the wiring job to make sure no mistakes were made. Plug a key into the key jack, leaving

This view shows the completed transmitter. The two-terminal tie point for the leads from the power supply is seen on the left side, inside the chassis box. The metal shield for the oscillator tube is not shown but should be put over the tube for actual operation.

The input circuit of the 6BQ6-GA is shielded from the output side by means of a metal plate which can be made from a piece of tin or aluminum. The piece of metal is formed as shown in the photograph and held in place by one of the tube-socket screws.





Bottom view of the power supply. The 115-volt a.c. input plug is visible on the left-hand side. The by-pass condensers, C_{21} and C_{22} , appear on either side of the plug, inside the chassis.

the key open. Turn the amplifier screen grounding switch, S_2 , to the position that grounds the screen. This renders the amplifier inoperable and provides protection for the amplifier tube during tune-up. A 25-watt lamp bulb can be used as a dummy antenna. It should be connected between the output jack, J_5 , and ground.

With a crystal in J_1 and the key open, the 115-volt switch is turned on. Allow a few minutes for the tubes to warm up. Switch the meter to read the grid current in the 6BQ6-GA, keeping S_2 set to ground the screen grid. On 40 meters, using either a 3.5- or 7.1-Mc. crystal, the meter should read 6 or 7 ma. when the key is closed and C_9 is tuned to resonance. Tune for maximum reading,

open the key, and then switch the meter to read the plate current of the final amplifier. Set S_2 to its "operate" position, close the key and tune C_{12} for minimum current reading. This point will be resonance in the final amplifier tank circuit. The dummy antenna should show some light. If it doesn't, tune C_{15} until the lamp lights up. The plate current can be brought up to read 100 ma., or approximately half scale. Be sure to have C_{12} tuned to show minimum current or "dipped."

The same procedure can be followed for 15 meters. It may be necessary to adjust C_2 to obtain the maximum amount of grid current for a particular crystal. Some crystals oscillate better than

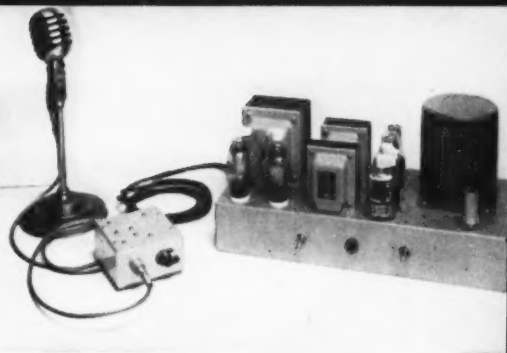
(Continued on page 132)

Shopping List for Novice Transmitter

- | | |
|---|---|
| 9 0.001- μ f. disk ceramic condensers ($C_4, C_5, C_6, C_{13}, C_{14}, C_{19}, C_{20}, C_{21}, C_{22}$) | 1 2.5-mh. r.f. choke (RFC_2) (Millen 34300) |
| 3 0.01- μ f. disk ceramic condensers (C_7, C_{11}, C_{14}) | 1 D.p.d.t. toggle switch (S_1) |
| 1 0.002- μ f. mica condenser (C_8) | 1 S.p.d.t. toggle switch (S_2) |
| 3 220- μ f. mica condensers (C_1, C_2, C_{10}) | 1 S.p.s.t. toggle switch (S_3) |
| 1 3 30- μ f. trimmer condenser, compression type (C_3) | 1 0-1-milliammeter (MA) |
| 1 100- μ f. variable condenser (C_9) (Hammarlund HF100) | 1 Power transformer, 360 v. each side c.t., 110 ma., 6.3 v., 3.5 amp.; 5 v., 3 amp., (T_1) (Stancor PC8410) |
| 2 140- μ f. variable condensers (C_{12}, C_{15}) (Hammarlund MC1408) | 1 Nine-pin miniature socket with shield |
| 2 8- μ f. 450-volt paper electrolytic condensers (C_{17}, C_{18}) | 2 Octal sockets, one isolantite, one bakelite |
| 1 0.1-megohm resistor, $\frac{1}{2}$ watt (R_1) | 1 6CL6 tube |
| 1 15,000-ohm resistor, 1 watt (R_2) | 1 6BQ6-GA tube |
| 1 5000-ohm resistor, 10 watts (R_3) | 1 5Y3 tube |
| 1 500-ohm resistor, $\frac{1}{2}$ watt (R_4) | 4 One-inch right-angle shelf brackets (for mounting tube sockets) |
| 1 27,000-ohm resistor, $\frac{1}{2}$ watt (R_5) | 1 Plate cap, $\frac{1}{4}$ inch (Millen 36004) |
| 1 27-ohm resistor, $\frac{1}{2}$ watt (R_6) | 2 Transmission-line plugs (Millen 37412) |
| 1 4700-ohm resistor, 1 watt (R_7) | 1 Phono jack (J_5) (RCA type) |
| 1 50,000-ohm resistor, 10 watts (R_8) | 4 Isolantite stand-offs, $\frac{3}{4}$ inch |
| 1 4700-ohm resistor, $\frac{1}{2}$ watt (R_9) | 3 One-terminal tie points |
| 1 3-inch length of B & W Miniductor stock No. 3015 (L_1, L_2 ; see text) | 3 Two-terminal tie points |
| 1 3-inch length of B & W Miniductor stock No. 3011 (L_3 ; see text) | 24 6-32 $\frac{1}{2}$ -inch screws |
| 1 10.5-hy. 110-ma. filter choke (L_4) (Stancor C1001) | 24 6-32 nuts and lockwashers |
| 1 6.3-volt panel indicator assembly (I_1) | 6 4-40, $\frac{3}{4}$ -inch screws |
| 1 6.3-volt bulb No. 47 or equivalent | 6 4-40 nuts and lockwashers |
| 3 Crystal sockets (J_1, J_3, J_4) (Millen 33102) | 6 Soldering lugs |
| 1 Open-circuit jack (J_2) | 1 3 \times 7 \times 12-inch aluminum chassis |
| 3 2.5-mh. r.f. chokes (RFC_1, RFC_3, RFC_4) (Millen 34102, National R100s) | 1 7 \times 12-inch aluminum bottom plate |
| | 1 3 \times 5 \times 7-inch chassis |
| | 10 feet of hook-up wire |
| | 3 Knobs for C_9, C_{12} and C_{15} |
| | 12 No. 6 self-tapping screws |

This Class AB₁ modulator is complete with all supplies, ready to be hooked to a Class C r.f. amplifier. Using two 6146s, it is capable of audio outputs up to 120 watts, depending on the plate voltage selected. The first two stages of speech amplification are built into a small box that may be used at the operating position while the main chassis is installed in any convenient location.

Components on the chassis are, left to right, power transformer and 816 rectifiers, filament transformer and plate filter choke, 6146s and VR tubes, modulation transformer and, in the right foreground, the 6C4 final speech amplifier stage.



120 Watts of Audio Without Driving Power

Class AB₁ Modulator with 6146s

BY GEORGE GRAMMER,* W1DF

• Unlike most tubes, the 6146 will develop almost as much power output without driving power as with it. This article describes a complete modulator unit that takes advantage of this characteristic. Various power levels can be obtained, depending on the choice of power supply components.

The modulator includes a splatter filter, made from inexpensive components, that can be applied to practically any 'phone transmitter where the Class C plate current does not exceed about 300 ma.

THE rather interesting capabilities of the 6146 as a Class AB₁ audio amplifier do not seem to have attracted much attention in amateur circles, although it is a fact that a pair of tubes is capable of delivering practically the same audio power in AB₁ as in AB₂. Either way, it is possible to get enough power to modulate a Class C input of a quarter kilowatt. When a choice is available, it is hardly likely that anyone would select AB₂, with its driver regulation problems, in preference to AB₁ — especially when no-driving-power operation usually means that one less speech amplifier stage will be needed for the same over-all gain.

The modulator shown in the accompanying photographs uses a pair of the tubes in AB₁ and, with the exception of the preamplifier unit (which could easily have been included on the same chassis if it had been desired) is complete with power and bias supplies on a 7 × 17 × 3-inch chassis. The preamplifier was deliberately made into a separate unit in the thought that, while it is highly desirable to have the microphone input and gain control within easy reach at the operating position, there is no reason at all why the rest of the audio equipment should be in the

same vicinity. The modulator and power supply have no controls that need be manipulated, nor do any of the tubes or components require watching during transmitting periods. This section can simply be tucked away in some spot where it won't take up room that might be used more profitably for other purposes.

The modulator-power supply unit includes one stage of speech amplification, and also is equipped with a splatter filter and an audio take-off for 'scope monitoring. It is easy to build in the latter two at the start, but somewhat messy to add them externally after it becomes appreciated that they should be classed as necessities rather than accessories.

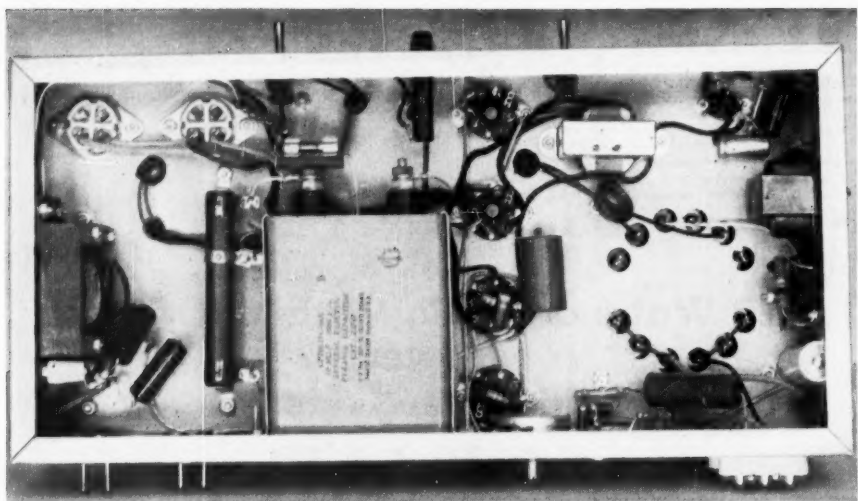
Tube Capabilities

The audio power that can be obtained from a pair of tubes is, of course, a function of the plate voltage used on them. The following table is illustrative:

Plate Voltage	Power Output	Plate-to-Plate Load Resistance
500 volts	84 watts	4200 ohms
600 volts	104 watts	5200 ohms
750 volts	134 watts	6700 ohms

The power output figures are calculated from data taken from the published tube curves, using a screen voltage of 200, and the actual outputs will be somewhat lower because of losses in the output transformer. These "theoretical" output figures cannot be compared directly with those given by the tube manufacturers in tables of typical operating conditions, partly because of somewhat different choice of load resistance and partly because the manufacturers' figures usually are based on the fundamental-frequency component of power output, with distortion components given separately as a percentage. The figures in the table above are more properly described as the average power in a sine wave having the same instantaneous power at the peak

* Technical Editor, QST



Bottom view of the modulator and power supply. The sockets at the upper left are for the 816s. The splatter-filter choke is mounted on the left-hand chassis wall, using small cone stand-offs as tie points for the high-voltage connections. The large resistor to the left of the filter condenser is the dropping resistor for the low-voltage circuit; the filter condenser is supported from the rear (lower, in this picture) chassis wall. The 6C4 speech amplifier circuit is at the upper right, with a shielded lead carrying the audio input to it from the four-prong socket, J_2 , mounted on the rear wall of the chassis. T_1 , the interstage audio transformer, is to the left of the 6C4 socket. Bias-supply components, with the exception of the output potentiometer, R_1 , are mounted on the right-hand chassis wall. R_2 is on the rear wall, near the lowest of the four sockets in a vertical line. The 'scope take-off circuit is at the lower right.

of an a.f. cycle as the waveshape actually considered — or, for short, “equivalent sine-wave power output.” Since it is the *peak* power that counts in determining the modulation percentage, and all our discussions of modulator power use this same “equivalent sine-wave power” as a basis, we believe this kind of figure to be more useful in modulation calculations with voice waveforms.

Suitable sets of components for all three of the voltages listed above are readily available, so the power level can be selected to suit the Class C amplifier to be modulated. For purposes of estimating, measurements have shown that the actual power outputs to be expected are approximately 75, 95, and 120 watts for the 500-, 600-, and 750-volt conditions, respectively. The modulator shown in the photographs is set up for 600-volt operation, but sufficient chassis area has been assigned to the power and modulation transformers to accommodate the next larger size of the same style. Other than these two transformers, all other components are the same regardless of the voltage level.

The Preamplifier

The preamplifier circuit, shown in Fig. 1, is built in a 2 by 4 by 4 aluminum box. It uses a 12AX7 for two resistance-coupled triode stages. The circuit is quite straightforward, except

for the fact that a 0.003- μ f. condenser is used for coupling between the first and second stage. The object of this is to help taper the low-frequency response for more effective speech work. Comparatively, the time constant of the input grid circuit seems quite large, but the effective resistance from grid to cathode is much lower than the 2.2-megohm resistor would indicate because of the flow of “initial velocity” electrons in this circuit. This current flow provides the operating bias of about 1 volt. (It should not be confused with the grid current that results from rectification of an applied signal; there is no rectification of the latter type in this case.)

The 12AX7 is mounted on a small bracket fastened to one removable side of the box, as shown in one of the photographs. With the

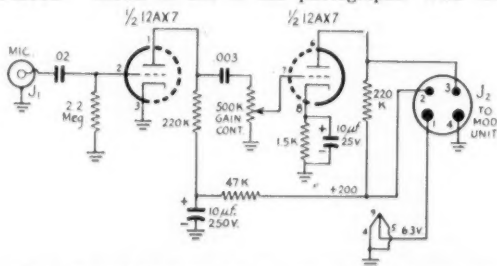


Fig. 1—Preamplifier circuit. Fixed resistors are $\frac{1}{2}$ watt. Condenser capacitances in μ f.

J_1 — Microphone connector.

J_2 — Four-prong connector, chassis mounting, male.

exception of the microphone connector and gain control, which are on one edge of the box, and the connector, J_2 , on the opposite edge, all components are on this same plate, mounted between appropriate tube-socket pins and tie-point strips. Enough lead length is allowed from the components on the box itself to permit taking off the plate to get at the wiring. Rubber feet are mounted on the other removable side of the box, which becomes the bottom when the unit is in use.

The preamplifier is connected to the modulator through a 10-foot length of cable (Alpha Wire Co. No. 1242) having one shielded and two unshielded conductors. The shielded wire, connected to Pin 3 of J_2 in Fig. 1, is used for the audio output. The shield is the common ground connection through the cable. One of the other two wires is used for plate current and the last for filament current. The shielded wire in this length of cable has a capacitance of about 500 $\mu\text{f.}$, and since this capacitance shunts the output circuit there is considerable reduction of high-frequency

response in the cable — about 4 db. per octave above 1000 cycles. This is compensated for in the modulator unit.

Modulator and Power Supply

The circuit diagram of the modulator and power supply section is given in Fig. 2. The "high-boost" circuit, consisting of the two resistors and 270- $\mu\text{f.}$ condenser associated with the grid of the 6C4 speech amplifier, compensates for the drop in highs in the cable coming from the preamplifier. Since low-frequency attenuation is desirable, an inexpensive interstage audio transformer is used for coupling the speech amplifier and modulator. The modulation transformer is a multimatch type delivering output to the load through a splatter filter, about which more later. The three 1-megohm resistors form a voltage divider for delivering about $\frac{1}{3}$ of the total audio output voltage direct to the horizontal plates of a monitoring 'scope for forming a trapezoidal pattern without amplifiers in the 'scope. The resistor values can be varied, if necessary, to

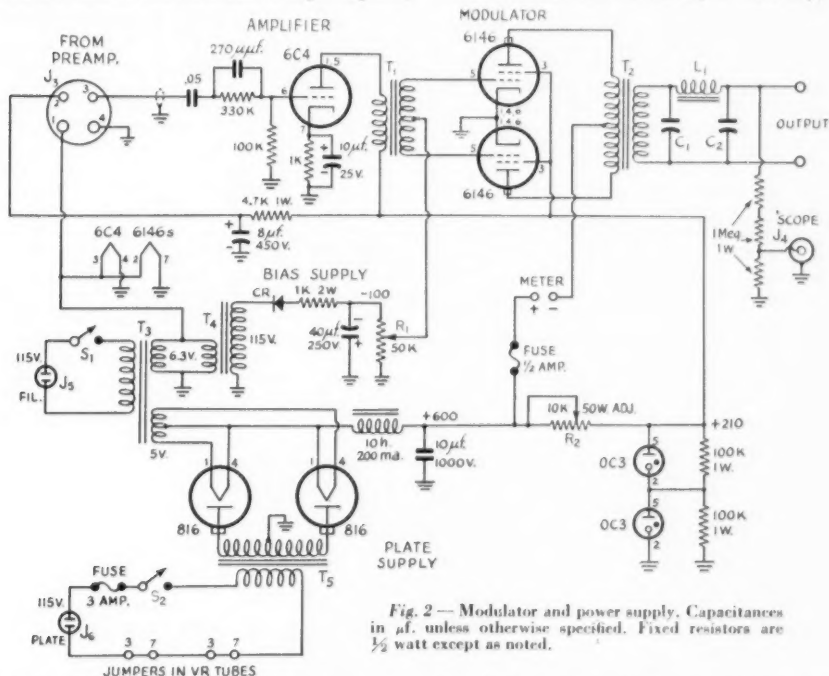


Fig. 2 — Modulator and power supply. Capacitances in $\mu\text{f.}$ unless otherwise specified. Fixed resistors are $\frac{1}{2}$ watt except as noted.

- C_1, C_2 — 1600-volt paper. See Fig. 3 for values.
 R_1 — (Bias control) 50,000-ohm potentiometer, preferably wire-wound.
 R_2 — 10,000 ohms, 50 watts, adjustable.
 L_1 — See Fig. 3 and Table I for values.
 CR — Selenium rectifier, 20 ma. or larger, for 115-volt operation.
 J_3 — Four-prong connector, chassis mounting, female.
 J_4 — Phono connector.
 J_5, J_6 — 115-volt connector, chassis mounting, male.
 S_1, S_2 — S.p.s.t. toggle switch.
 T_1 — Interstage audio, ratio 3:1, push-pull secondary (Thordarson T20A19).

- T_2 — Multimatch modulation transformer (UTC CVM-2 or CVM-3, depending on audio output power level).
 T_3 — Filament transformer, 6.3 volts at 8 amp.; 5 volts at 3 amp. (Triad F-39A).
 T_4 — Filament transformer, 6.3 volts at $\frac{1}{2}$ amp. (Triad F-14X).
 T_5 — Plate transformer. For 500 volts d.c.: 1235 v. c.t., 310 ma. (Triad P-7A); for 600 volts d.c.: 1455 v. c.t., 310 ma. (Triad P-11A); for 750 volts d.c.: 1780 volts c.t., 310 ma. (Triad type P-13A).

secure the proper pattern width, although the total resistance should be maintained in the neighborhood of 3 megohms for a 0.005- μ f. coupling condenser. This condenser should have a voltage rating equal to at least twice the d.c. plate voltage on the modulated amplifier; 6000-volt paper condensers in this capacitance are readily available and inexpensive.

Plate power for all tubes is supplied from one transformer. A single-section choke-input filter is used for the high voltage applied to the plates of the 6146s. This is dropped through a resistor and a pair of VR-105s (0C3) in series to provide a regulated voltage of 210 for the 6146 screens. This voltage also is applied to the plate of the 6C4 speech amplifier and, with further filtering by the 4700-ohm resistor and 8- μ f. condenser, to the preamplifier tube plates through Pin 2 of J_3 . The dropping resistor, R_2 , should be adjusted to approximately 5000 ohms with a 500-volt supply, 7000 ohms for 600 volts, and 10,000 ohms for 750 volts. This adjustment can be checked when the modulator is in operation by observing whether the VR tubes go out on voice peaks. Enough current should be bled through the regulators so that they stay ignited at all voice levels.

A pair of terminals is provided for connecting a milliammeter in series with the plate lead to the 6146s. The meter itself can be placed in any convenient spot. If it is not used, a jumper must be connected across the terminals. This circuit is fused to protect the meter.

The bias supply uses a small filament transformer, T_4 , operating from the regular filament transformer, T_3 , to provide 115 volts for the bias rectifier and filter. Bias is adjusted to the proper value by means of R_1 . This supply does not have to be "stiff" since no rectified grid current flows through it in normal Class AB₁ operation, but the resistance should be moderately low. If too much resistance is used in R_1 , occasional peaks that do go into the grid-current region will cause a

temporary change in bias through charging the bias filter condenser, which then cannot discharge rapidly enough through R_1 . The values indicated have worked out well in practice.

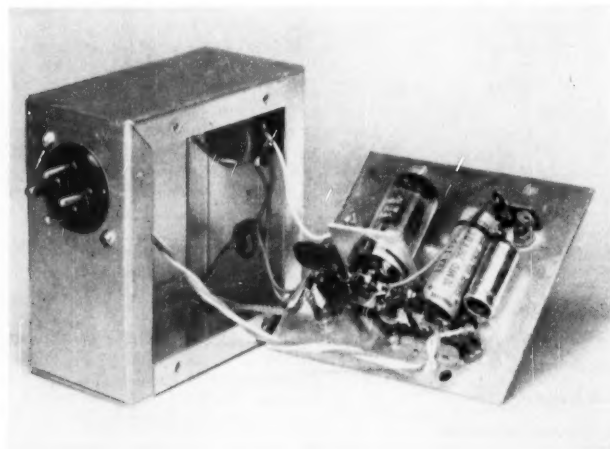
Separate a.c. input connectors are used for the filament and plate supplies; when S_1 and S_2 are closed these can be controlled by remote switches. The bias supply goes on with the filaments, and since there is no time lag in the selenium rectifier the 6146s are always protected.

Clipping and Filtering

A high-level splatter filter can be built from parts that can be obtained quite inexpensively from practically any supply house that handles service components. The cost of the one incorporated in this modulator is only a little over three dollars.

The application of the filter is based on principles outlined in *QST* some time ago.¹ In brief, its purpose is to suppress audio components beyond about 3 kc. in the modulator output, particularly those generated by clipping that may take place, either intentionally or unintentionally, in the modulator. The legitimate high-frequency components of the average voice are seldom of any real consequence in causing unnecessary interference; the bothersome "splatter" is practically always the result of clipping, either in the modulator because of insufficient power output capability or overdriving, or in the Class C stage modulated stage itself. In the latter stage, the usual cause is overmodulation on down peaks, but improper operating conditions resulting in poor linearity also will result in splatter. No splatter filter can overcome imperfections in the Class C stage, nor can it compensate for the clipping that takes place when the plate voltage "hits bottom" on the down peaks of modulation.

In other words, the first step in splatter elimination is to adjust the modulated Class C amplifier for good linearity — that is, make sure that it is really capable of 100 per cent modulation. Next, steps must be taken to ensure that the



The preamplifier removed from its 2 by 4 by 4 box. Arrangement of components is not critical; in this case most of the unit is mounted on one of the removable sides of the box for ease in wiring and accessibility.

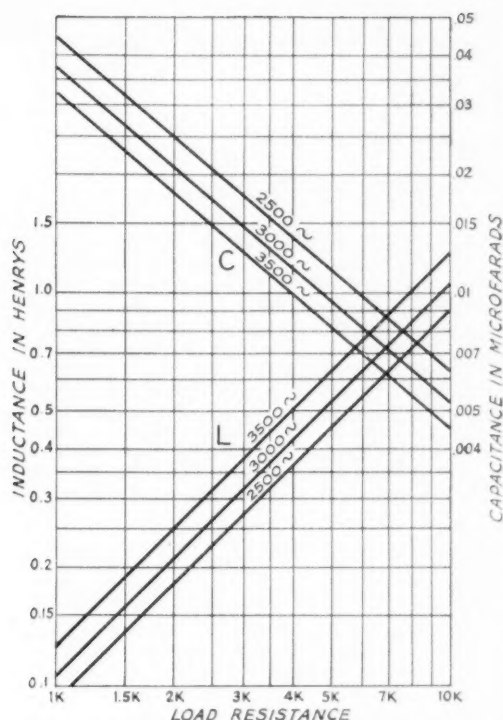


Fig. 3 — Splatter-filter design chart. Values should be taken from L and C curves marked with the same cut-off frequency.

applied modulation cannot exceed 100 per cent in the downward direction; this is the function of clipping. With a Class AB₁ modulator the clipping can take place either in the plate circuit, by adjustment of the load resistance as described by Breune,¹ or in the grid circuit by driving the modulator grids positive during the peak of the audio cycle. When the modulator grids are driven positive by a Class A voltage amplifier such as the 6C4 in this unit, the clipping is quite effective because of the poor voltage regulation of the driver when it is called upon to deliver power. Preferably, the modulator load resistance should be adjusted so that clipping in the plate circuit occurs simultaneously with clipping in the grid circuit, since if clipping occurs in one circuit before the other the power output is reduced below the maximum obtainable. However, the loss in output is negligible if the load resistance does not depart more than 10 per cent from the optimum value, so exact adjustment is not really necessary. In practice, grid-circuit clipping is likely to predominate, and the output amplitude will almost automatically be at the right level if the Class C plate input is adjusted to be at least twice the audio output of the modulator (assuming the modulator load resistance is near the optimum value). The system should be adjusted so that clipping occurs at a modulation level of 90 to 95

per cent; this ensures that the clipping will be done only in the modulator and not in the modulated amplifier where the splatter filter can do nothing about it.

This modulator was not designed particularly for intentional clipping, although there is nothing to prevent its being used that way to the degree permitted by the signal-handling capability of the circuits up to the grid of the 6C4. However, clipping is bound to occur in any modulation system unless special means such as automatic gain control are included for preventing it. Lacking such means, steps should be taken to prevent clipping from causing splatter. A splatter filter, plus the adjustment precautions outlined above, will do a good job of keeping the transmitted signal clean.

Filter Design

The filter used in this modulator is a simple one of the constant- k type. The inductance and capacitance required will depend on the Class C load resistance and therefore cannot be given in a single specification. The chart of Fig. 3 gives the design values for various loads from 1000 to 10,000 ohms, for three cut-off frequencies, 2500, 3000, and 3500 cycles. While a cut-off frequency of 3000 cycles is probably optimum, the additional curves are given for the purpose of estimating the effect of having to use available values of components, particularly fixed condensers. For example, if the Class C load resistance (plate voltage divided by plate current in amperes) is 4000 ohms, the chart shows that approximately 0.012 μ f. should be used at C_1 and C_2 . The nearest standard value in a single unit is 0.01 μ f., and the chart shows that this is the proper value for a cut-off frequency of 3500 cycles. The inductance could be chosen accordingly (0.5 henry, from the chart) or, as an alternative, 0.01 and 0.002 units could be connected in parallel. Neither approach is quite as clean-cut as it

(Continued on page 118)

TABLE I

Measured inductance values for various air-gap spacings, "1-henry 300-ma." filter choke (Stancor C-2326) with 7 layers (approximately 30 per cent of turns) removed.

Air gap, inches	Inductance, henrys
0.003	0.71
0.019	0.62
0.020	0.48
0.025	0.46
0.050	0.36
0.075	0.31
0.100	0.28
0.125	0.26
0.15	0.24

Dual Regulated General-Purpose Power Supply

A Useful Adjunct to Any Station

BY VINCENT W. HANSEN,* W5RVD

• If you do any building or testing around the shack or workshop, there have undoubtedly been dozens of times when you could have used a versatile power supply. If you build a unit like the one described here by W5RVD, your troubles will be over. No more scrounging around for power supplies and dropping resistors — just twist a knob and set the supply at the output voltage you want.

MANY years of constructing experimental circuits and then finding it necessary to steal power for them from other equipment led to the conclusion that a good general-purpose power supply would be a valuable asset on our shelf of test equipment. Preliminary thinking on the subject indicated several basic requirements which such a supply should be capable of fulfilling. Perhaps the most important of these is that it should be extremely versatile. It might be desirable on one occasion to have a d.c. filament supply for a high-gain low-level preamplifier, and on another a husky bias supply might be required for a high-power r.f. amplifier. Generally, however, the supply would be used for the voltages and currents normally encountered with receiving tubes. In addition, it should be capable of supplying more than one output voltage at any time. In line with the modern trend, it should be as compact as practicable. With these requirements in mind, the dual regulated power supply to be described in this article was designed and constructed.

The Basic Principle

In order to understand the capabilities and limitations of the unit, a brief review of the op-

*3216 A St., Box 23, Sandia Base, Albuquerque, N. M.

erating characteristics of electronic voltage regulators is in order. A simple regulator of this type is shown in Fig. 1. The supply voltage, which comes from an ordinary power supply, is delivered to its load through a series tube, V_1 , which is made to act like a variable resistor whose resistance is controlled by the voltage appearing at its output. V_2 and its associated circuitry constitute a high-gain d.c. amplifier to accomplish this. Resistors R_1 and R_2 are simply a screen voltage divider used to supply proper operating potentials to the screen. R_3 is the plate load for V_2 , and the potentiometer, R_4 , sets the operating

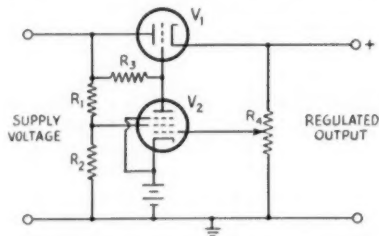


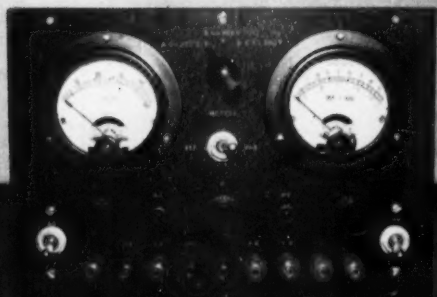
Fig. 1—The basic circuit of a voltage-regulated power supply.

point. The battery in the cathode circuit provides a constant reference for comparison with that portion of the regulated output voltage appearing between the tap of R_4 and ground.

The plate of the amplifier tube is tied directly to the grid of the series tube, and the amplifier's plate voltage appears as bias on V_1 . Since R_4 sets the operating point of V_2 and the plate voltage of V_2 appears as bias on V_1 , R_4 will control the effective resistance of V_1 and thus the output voltage of the regulated supply. If, for any reason, the output voltage attempts to increase from this value there will be a proportionate increase in the voltage at the grid of V_2 . Because the cathode voltage of this tube remains constant, this in-

A regulated power supply is a handy thing to have around the shack or workshop. This unit is complete with meters, and can supply two different regulated voltages at any time.

QST for



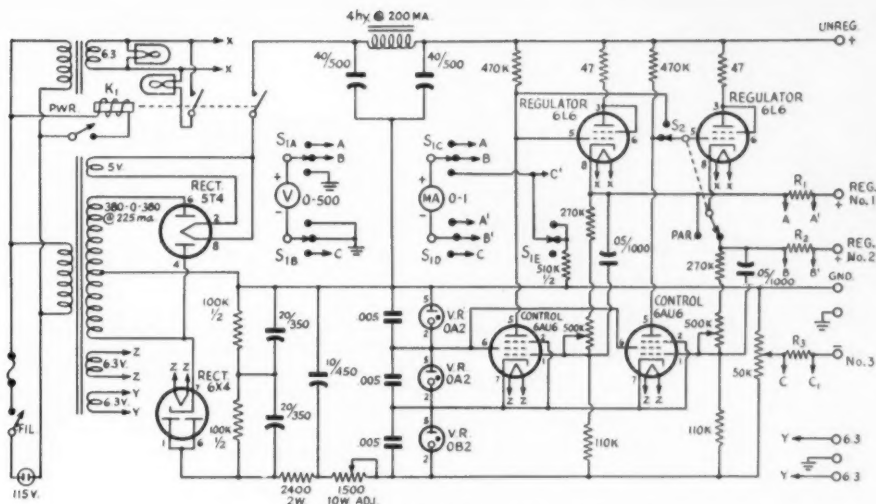


Fig. 2 — Wiring diagram of the dual regulated power supply.

R₁ — 200-ma. shunt for MA.
R₂ — 100-ma. shunt for MA.
R₃ — 10-ma. shunt for MA.
K₁ — 115-v. a.c. d.p.d.t. relay (Advance K-1500).

S₂ — 5-pole 3-position wafer switch.

All resistors 1-watt unless otherwise designated. All capacitors electrolytic, except 0.005- μ f., which are ceramic.

crease in grid voltage will cause V_2 to conduct more heavily, resulting in a greater voltage drop across R_3 and an increase in the effective resistance of V_1 , which will tend to return the output voltage to its original value. If the output voltage should drop, the opposite action takes place and again the voltage will be returned to its original value.

It is interesting to note that the regulator will compensate for practically any change in output voltage. Thus the circuit will tend to cancel out ripple as well as changes due to variation in load or supply voltage.

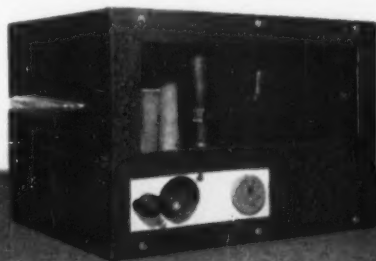
The Circuit

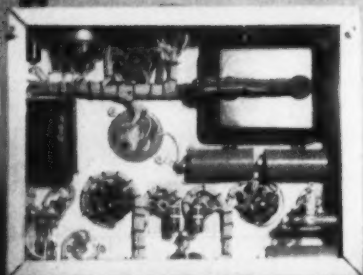
The supply shown in Fig. 2 was evolved from this basic regulator circuit. A standard condenser-input power supply delivers voltage to the two outputs through the 6L6 series tubes. To make the supply regulate down to zero output voltage, it is necessary to supply negative bias potentials on the 6L6 series tubes. To satisfy this requirement a negative source consisting of a 6X4 rectifier and an RC filter was incorporated. With the cathodes of the 6AU6 control tubes 300 volts

negative the plate voltage swing can reach a point far enough negative to cut off completely the series tubes, resulting in zero output voltage from the regulator. VR tubes replace the battery in Fig. 1 as a means of supplying the constant reference voltages required. The small ceramic capacitors across these tubes prevent a tendency toward oscillation in this circuit. The regulated output voltages can be set from zero to 450 volts by adjustment of the 0.5-megohm controls. The 0.05- μ f. condensers from the cathode of the series tubes to the grids of the control tubes provide a low impedance to any ripple voltage that may be present, resulting in even greater ripple reduction. Switch S_1 permits two modes of operation. In the position shown, two independent outputs are available. In the other position, the two series tubes are in parallel and both are controlled by the 6AU6 at the left. This makes one output of doubled current capacity available.

The -C output can be set between the limits of zero and -300 volts. This output is intended only for Class A bias applications and has a capacity of about 5 ma. with poor voltage regula-

Adequate ventilation is insured by the large window in the rear of the cabinet.





The panel is mounted away from the chassis, to provide room for the binding posts.

tion. At some settings of this control the current drawn by the meter circuit will cause a noticeable change in output voltage, so a 0.51-megohm resistor was added on the meter switch to replace the meter when it is switched to a different output.

A direct connection to the filter bypasses the regulators to the "Unreg" binding post. This can be used where high voltage is desirable or in conjunction with a series resistor to supply part of the current to a load that exceeds the capabilities of the regulator section. A 6.3-volt 8-amp. filament circuit and a floating ground binding post complete the outputs. Two chassis ground binding posts are also mounted on the panel. For the supply itself, two separate filament circuits are required to keep the filament-cathode potentials from exceeding the rated values by too great a margin. One of these circuits supplies the series tubes and the other the control tubes and negative rectifier. There should be no grounds on either of these circuits. A relay is used to switch the high voltage and to light a second pilot light when the power switch is closed.

Complete metering is provided by means of a 0 to 500 voltmeter and a 0 to 1 milliammeter with appropriate shunts. The meter shunts are connected permanently in their respective leads and the meter is switched across them. All outputs are brought out to binding posts on the front panel and also to an octal socket (not shown in Fig. 2) on the rear drop of the chassis. Use of the floating-negative arrangement makes it possible to ground either the plus or minus terminal of the supply, permitting its use as a high-current negative source as well as in the usual manner.

Construction

The supply is built on a 7 × 9 × 2-inch chassis mounted in a standard 7 × 8 × 10-inch utility box. While this is extremely compact for the amount of circuitry involved, sufficient clearances have been maintained to permit reasonable ease of construction and maintenance. The chassis is fastened to the panel by four 1-inch brass spacers. This brings the back of the chassis flush with the rear of the cabinet and allows clearance for the panel-mounted components in front of the chassis. Because the unit will be too heavy

to be supported entirely by the panel, two 7/16-inch spacers are fastened to the bottom lip near the rear of the chassis, as can be seen in one of the photographs. The bottom of the cabinet has a row of seven 1/2-inch holes on a centerline one half inch back from the front edge. These permit circulation of air, to dissipate the heat generated. A 3 × 8-inch cutout on the rear wall is also provided for ventilation. The back wall has another cutout to provide access to the plugs and fuse on the chassis rear drop. Adding a pair of chrome-plated kitchen-cabinet handles completes the cabinetwork.

Wiring

With the exception of the grid circuits of the 6AU6 control tubes, wiring is not critical and no special precautions are necessary. However, these two tubes are very high gain amplifiers and any hum pick-up by their grids will appear, greatly amplified, at the supply outputs. For this reason caution should be exercised in placement of these leads, or shielded wires should be used. Cabling is employed throughout to make a neater looking package and to keep the large number of wires from getting out of hand. The meter shunts are wound with resistance wire on forms removed from small r.f. chokes. High-value one-watt resistors could also have been used. They should be wound originally with an excess of wire so that they can be trimmed to their correct values after the rest of the supply is complete. These shunts and the 0.51-megohm resistor should be mounted directly across the meter switch, S_1 . A small resistor board mounted on the front drop of the chassis holds the 0.27- and 0.11-megohm resistors. The rest of the resistors and tubular condensers are mounted where convenient on the tube sockets, with the aid of a few small stand-off insulators. The relay and the filament transformer are mounted along the left side of the chassis.

The panel should be removed from the chassis and its wiring done first. When the wiring is complete, the chassis leads should be fed through the hole provided on the front drop and the panel secured to the chassis. The chassis cable lays along the front and left side with break-offs as required to pick up all components. A little study of the bottom-view photograph will suggest the best wiring procedure.

When the wiring has been completed and checked, the a.c. should be turned on and the

Components for the dual regulated power supply fit nicely on a 7 × 9 × 2-inch chassis.



1500-ohm resistor adjusted for about 20 ma. through the VR tubes. After this adjustment has been made, the high voltage can be turned on and the operation of the supply checked. If it appears normal, the shunts can be trimmed to their correct values. This can be conveniently done by using the supply as follows: With the meter switch, S_1 , in the "A" position and S_2 in the parallel position, connect a 750-ohm resistor in series with a multimeter across the "A" output terminals. Then adjust the "A" voltage control to give a reading of 200 ma. on the multimeter. If a little extra resistance wire is wound on the form, the meter on the supply will read high, and the extra wire can be removed a bit at a time until the readings of the two meters coincide. The same

procedure can be used with suitable resistors to adjust the "B" and "C" shunts to 100 and 10 ma. full scale, respectively. When this is done, the supply should be complete and ready for operation.

A voltage-vs.-current graph for the main supply section is shown in Fig. 3A, and an over-all performance curve of the regulated outputs in Fig. 3B. The latter is derived from Fig. 3A and the 6L6 plate curves with the maximum current set at 100 ma. per tube and the maximum plate dissipation set at 25 watts. This may seem a bit high for the 6L6s, but it appears to be quite common practice when they are used for this purpose.

Referring to Fig. 3B, the drop-off at the low-voltage end is the result of the current being limited by the maximum plate dissipation of the tubes. The drop-off at the high-voltage end is dependent upon the supply voltage and the minimum voltage required across the series tubes to force the desired current through them. For the parallel mode of operation, use the 200-ma. scale on Fig. 3B. The area of regulation will be under the solid line, and the regulator will maintain control for any combination of voltage and current that lies in this area. For either the A or B output independently, use the 100-ma. scale and the area of regulation will lie under the dashed curve. When both outputs are supplying power, the upper limit of regulation for each will lie somewhere between the solid and dashed lines. The degree of regulation is determined primarily by the gain of the d.c. amplifier. For this unit it is about 2 volts between the limits of 0 and 200 ma. when using the parallel mode of operation.

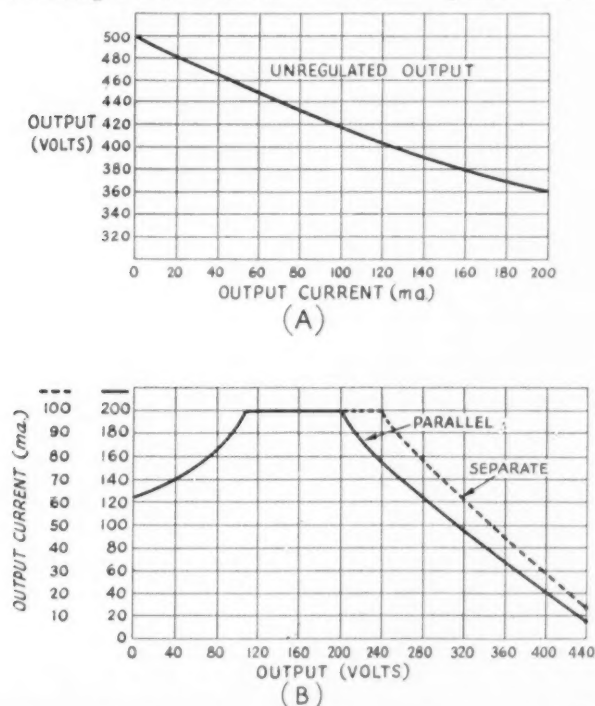
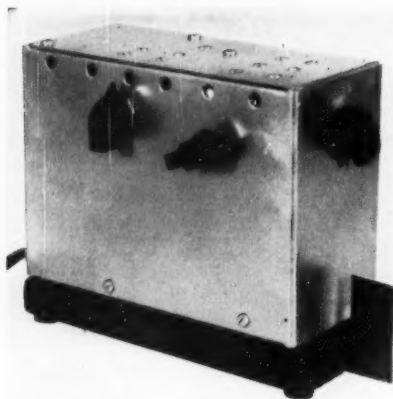


Fig. 3—Regulation of the unregulated power supply (A), and the area of regulation of the regulated supply (B).



The completely-assembled electronic keyer. The weight control, R_6 , is mounted on the front of the enclosure, above the keying paddle. Along the side, from right to left, are the speed control, R_3 , and tune-up switch which shorts the contacts of K_1 .

A Thyatron-Controlled Electronic Key

Simple Systems for Use with a Standard Bug

BY JACK D. GALLAGHER,* WSHZB

In building the keyer shown in the photographs, the writer has incorporated some desirable features not usually found in electronic keying units. Although the photographs show a special key mechanism which was constructed beneath the bug base in an effort to reduce the space consumed by the usual switching lever and associated contacts, an ordinary bug (with the connection between dot and dash contacts broken) can be used. The key lever and contacts pictured were added as the result of conversations with other amateurs who had made their own switching assemblies. Either polar or nonpolar relays, adjustable or nonadjustable, may be used with

• Here is a simple electronic key that will operate with a conventional bug as the switching lever. It is of the self-completing type, and requires only a minimum of tubes and other components.

equally good results. This feature is not usually found in the ordinary type of keyer.

Circuit Operation

The operation of the keyer to be described can be followed easily by referring to the circuit diagram of Fig. 1. The pulse circuit consists of a 2D21 thyatron gas tube connected to a voltage-regulated timing circuit consist-

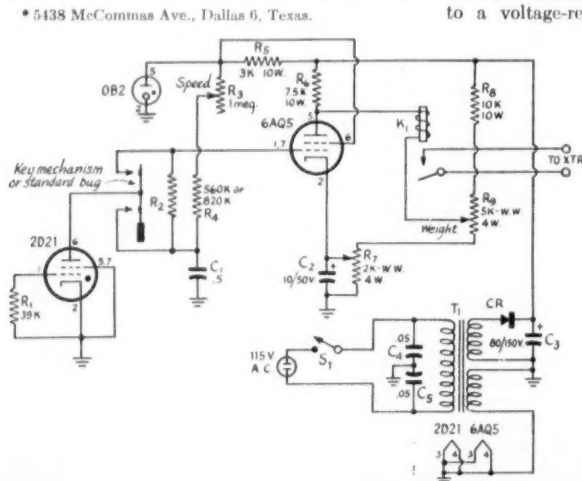
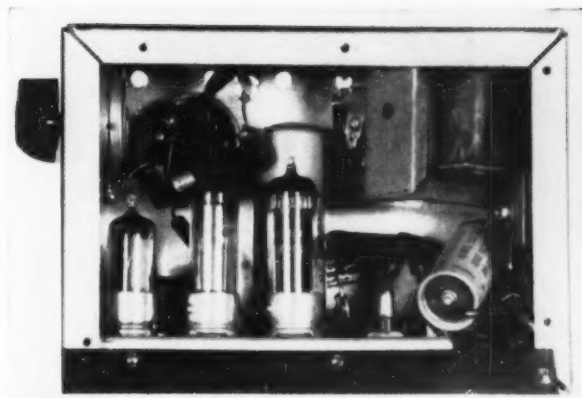


Fig. 1—Circuit of the thyatron-controlled keyer suitable for use with either polarized or nonpolarized relays. C_1, C_4, C_5 —Paper. C_2, C_3 —Electrolytic. R_2 —100 to 2000 ohms, depending on circuit conditions. R_3 —Linear-taper pot. K_1 —See text. T_1 —Power transformer: 125 v., 50 ma.; 6 v., 2 amp. (Stancor PA-8421 or equivalent).

All capacitances in μ f. All resistors $\frac{1}{2}$ watt unless otherwise designated.

Interior view of the thyatron-controlled electronic keyer, showing the mounting of the tubes, power transformer, and other components.



ing of C_1 , R_2 , R_3 , and R_4 , and the grid of a 6AQ5. When the key is in the neutral position, the timing circuit is kept charged by the supply voltage to a value equal to the 6AQ5 cathode voltage. In this idle condition, the weight control, R_9 , is adjusted for zero voltage across the relay winding. Operating the bug lever to the usual dash position causes the following:

- 1) The supply voltage on the timing circuit fires the 2D21 and reduces the voltage to C_1 and the grid of the 6AQ5.

- 2) As the timing condenser is discharged, the voltage across the 2D21 decreases to the extinguishing point.

- 3) As the grid voltage of the 6AQ5 is momentarily reduced, the plate current is also reduced, causing the plate voltage to rise.

- 4) This change in voltage across the relay winding causes it to operate. As soon as the voltage across the 2D21 reaches the extinguishing point, the circuit tends to revert to its normal idle condition.

As long as the dash or dot contacts are closed, the 2D21 will continue to fire and repeat the operation. The same action takes place when dots are being made, except that the voltage discharged from the timing condenser is a different value because of the voltage drop across the ratio resistor, R_2 . Since the timing condenser is not discharged as completely as it was in the case for producing dashes, the condenser recharges in a shorter interval of time.

The 0B2 regulator serves two purposes. First, it provides the timing circuit with a nearly constant voltage during key-down conditions. Secondly, it regulates the voltage changes in the 6AQ5 which results in better relay action.

Construction

The photographs show the general construction of the keyer. In the front view, the weight control, R_9 , is mounted in the top center of the $3 \times 5 \times 7$ -inch aluminum chassis which serves as an enclosure. The speed control, R_3 , is mounted on the left side, at the front, and to

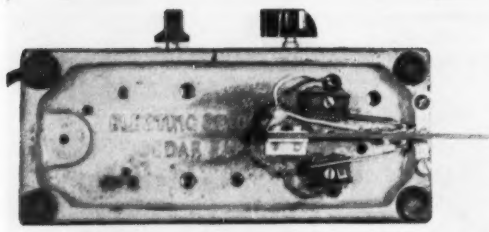
the right of a tune-up switch. This switch is not shown in the diagram, but it is merely an on-off switch connected across the relay contacts as an aid in tuning the transmitter.

In the photograph showing the interior view of the keyer, the weight control, R_9 , can be seen at the upper left. The tube sockets were mounted along with the relay and R_7 on a sub-chassis which was made to fit inside the aluminum enclosure. The 2D21 is at the extreme left, with the 0B2 regulator and the 6AQ5 to the right. The screwdriver-adjusted potentiometer, R_7 , can be seen to the right of the 6AQ5 and to the left of the 80- μ f. 150-volt filter condenser. The relay is mounted directly behind the 6AQ5. The power transformer is mounted upside down in the upper right corner of the cabinet.

The bottom view of the keyer shows the simplicity of the key mechanism and the location of the ratio resistor, R_2 . The dash and dot contact springs were taken from an old lever switch and mounted beneath the bug base as shown. A small piece of aluminum angle holds the end of the L-shaped paddle which was cut from a piece of fiberboard. The contacts mounted on the paddle were taken from an old relay. The swing of the paddle is limited by the two stops made from solder lugs mounted on the right end of the base. The contact spacing is about 0.004 inch.

Adjustment

A v.t.v.m. and an ohmmeter, or combination test instrument, can be used to advantage in adjusting the circuit for proper operation. First, the speed control, R_3 , the weight control, R_9 , and the cathode resistor, R_7 , should be set about midway in their respective ranges. Connect the v.t.v.m. across the cathode of the 6AQ5 and ground, and adjust this voltage to 30 volts by the use of R_7 . Remove the v.t.v.m. and connect an ohmmeter across the keying contacts of the relay and ground, and adjust the weight control, R_9 , so that the average fluctuations of the meter when making dashes is about 78 per cent "make," or 78 per cent toward the zero-resistance end of



Although a standard bug can be used, this view shows a homemade paddle assembled underneath an old bug mounting base. R_2 is across the stationary contacts.

the meter scale. When making dots, the ohmmeter should average between 54 per cent and 60 per cent "make." However, when the keyer is connected to the transmitter, the weight control should be adjusted for the proper signal characteristic.

As a matter of interest, with 39,000 ohms in the grid of the 2D21, the current with the key closed before pulses start is about 31 microamperes. Without this resistor, or if a resistor of lower value is used, the nonpulsing current through the 2D21 will be higher. This will limit the lowest speed obtainable where plate voltages of 140 to 150 volts are used. The approximate resistance of the 2D21 in this circuit before pulses start is about 0.71 megohm.

Even though the circuit shown in Fig. 1 can be used with either polar- or nonpolar-type relays, Fig. 2 shows a circuit in which only the usual open-close, or nonpolar, type of relay can be used. The current drain in this circuit is about 15 ma., or the current through the regulator tube and cathode resistor. In the idle condition, the plate current of the second triode section is cut off, because the regulator tube holds the bias voltage on its cathode. The only adjustment required in this circuit is setting R_9 so that the relay remains open in the idle condition. This potentiometer is also the weight control and can be adjusted easily to provide the proper relay action during sending. With some relays, a 0.1- μ f. condenser will be required across R_7 .

Relays

In searching for a good relay to use with the circuit shown in Fig. 1, the writer has found a good, sealed, nonadjustable relay which is excellent for use in this type of circuit. It is a

Western Electric type 276-G, and it is partly visible behind the 6AQ5 in the photograph showing the side view of the keyer. This is a sealed-in-glass mercury-contact relay. It is mounted on a small wafer-type octal base and housed in a metal shell about the size of a metal 6L6. It has a single armature, two separate back contacts and two separate front, or open, contacts. All contact surfaces are covered with a thin film of mercury. The pin connections from the bottom are as follows: Pins 1 and 2 are the normally open contacts; Pin 3 is the armature; Pins 4 and 5 are the back contacts. A 3300-ohm coil is connected between Pins 6 and 7, and a 700-ohm coil is connected between Pins 7 and 8. Thus, a 4000-ohm winding is available by using Pins 6 and 8. Pin 8 is positive with respect to Pin 6, and it is connected correctly in the keyer circuit with Pin 8 to the plate of the 6AQ5. The normal operating current is from 5 to 6 ma. The relay can be purchased from the Graybar Electric Company.

Of course, other relays can be used in lieu of the expensive model described above, but they should be sensitive plate relays with a coil resistance of from 2000 to 12,000 ohms. All of the major relay manufacturers make relays which are suitable for either of the two circuits and, from the information given, it is an easy matter to select a relay which will be satisfactory.

Both of the circuits shown were designed for ease of adjustment and economy. Either should prove to be a valuable piece of equipment for the amateur.

The writer wishes to thank W5FRE for his cooperation in the design of the two circuits presented as well as in the construction of the electronic key shown.

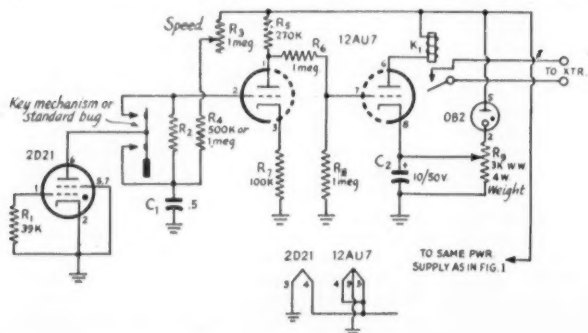
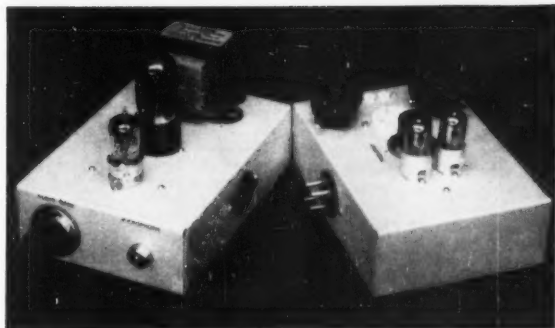


Fig. 2 — Circuit of thyatron-controlled keyer suitable for use with nonpolarized relay only.

C_1 — Paper.
 C_2 — Electrolytic.
 R_2 — 100 to 2000 ohms, depending on circuit conditions.
 R_3 — Linear-taper pot.
 R_7 — See text.
 K_1 — See text.
 Power supply same as Fig. 1. All capacitances in μ f. All resistors $\frac{1}{2}$ watt unless otherwise designated.

The simple transmitter for 220 and 420 Mc. is made in two parts. The modulator, left, may be retained for use with more advanced r.f. sections than the simple oscillator shown at the right. The two units may be plugged together or connected by a cable.



Technician Rig for 220 and 420 Mc.

A Two-Band Oscillator and Handy Matching Modulator

BY MASON P. SOUTHWORTH,* W1VLH

• "Those crystal-controlled dream rigs with the 25-dollar tubes are beautiful, but they scare me. How about something I can build for a few bucks to get some experience on 220 and 420 Mc.?" Here's an answer to this question, so often posed by v.h.f.-minded newcomers: a rig for both bands that is both simple and economical to build. The modulator portion can be used with any rig of similar power that you may build later on, after you've learned some of the ropes with the simple oscillator.

THIS rig was designed to make getting started on the two highest amateur bands now in regular use as simple as possible. It is thus made to order for the Technician licensee who wants to make use of his ticket. Even if you have more advanced equipment for 220 and 420 Mc., or expect to build it eventually, a rig like this is mighty handy to have around the shack. It will be useful in many ways, for antenna and receiver testing, and for local communication when you don't want to fire up those twenty-five-dollar bottles.

Although the serious work on 220 and 420 Mc. is being done with stabilized transmitters, there is still plenty of room for the modulated oscillator, so long as it is designed and operated with some care. In many sections of the country, development of activity is more important than getting stations on with the ultimate in quality gear. Crystal-controlled equipment described in recent years for these frequencies is fine for the fellow with some construction know-how, but its com-

plexity tends to scare off those who are short on cash or experience.

This transmitter will never set any DX records, but it can be used for interesting short-range work. Its signal may not justify glowing reports of "broadcast quality," but if you keep the modulation level low it can be copied, even on the more selective receivers. Stability is better than with v.h.f. oscillators of bygone years, thanks to today's improved tubes and components. What's more important, building the rig is simple enough so that even the beginner should have no qualms about trying it.

The modulator portion of the rig can be considered as a long-term investment. Built as a completely separate unit from the oscillator, it can be plugged into any r.f. section of similar or somewhat higher power that you may want to build in the future. Only two tubes are used, but it has ample gain for a crystal microphone. It thus delivers good quality speech, with an output of 3 to 10 watts of audio, depending on the choice of modulator tube and the plate voltage available. It can be used to modulate equipment like the 2E26 rigs described recently,¹ for example, in either home-station or mobile service. With minor changes it could serve for control-grid or screen modulation of higher-powered stages.

To minimize the cost of getting started, a single oscillator is used for both bands. To change bands it is merely necessary to replace one jumpered plug with another, making the tank circuit either a quarter-wave line for 220 Mc. or a half-wave line for 420 Mc. The unit may be set up so that no retuning or frequency measuring is necessary in the band-changing process. Two 6AF4s or 6AT4s are used in push-pull. These tubes are cheap and readily available, and they are relatively efficient, having been designed for u.h.f. TV converter service. An input of up to 8 watts can be run on either band. A single 200-volt

* Laboratory Assistant, QST.

¹ Tilton and Southworth, "A Step-by-Step Station for the V.H.F. Man," QST, October, 1954, page 16.

plate supply is required, and it can be built from inexpensive power supply replacement parts. Total drain of the transmitter, with modulator, is about 75 ma., at 200 volts, so it can be run easily from a small vibrator-type power supply for portable use if desired.

How the Tank Circuits Work

A while back we mentioned "quarter-wave" and "half-wave" lines. These terms may be so much double talk to anyone not familiar with v.h.f. circuitry, so let's see what they represent. We know, of course, that any transmitter output circuit consists of inductance and capacitance in the proper amounts so that it will "tune" to the frequency we're interested in. Schematically, it looks something like Fig. 1A. This is the sort of thing we find in circuits for our lower amateur bands. The basic elements are there for all to see: a pair of tubes, a plate tank coil, L_1 , and tuning condenser, C_1 , and an output coupling coil, L_2 . The tube capacitance and stray circuit inductance and capacitance are not important factors at frequencies up to 14 Mc. or so.

But as we go higher in frequency the coils and condensers get smaller and smaller, until the tube and circuit capacitances become an appreciable part of the total circuit. The limit of the coil-and-condenser approach is seen at B. Here L_1 has been reduced to a short loop between the terminals of C_1 . The output coupling is also a loop. We can make C_1 the smallest practical device for varying capacitance, and make L_1 a direct short

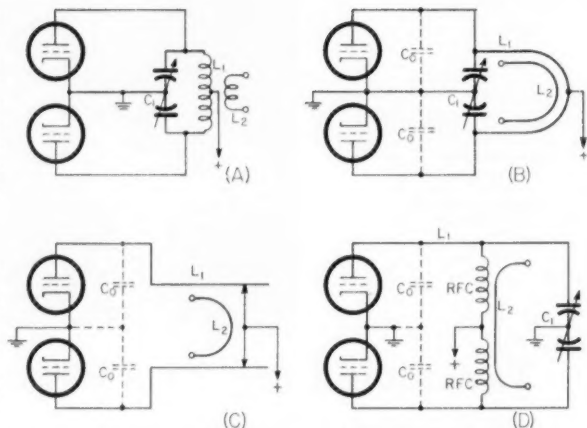


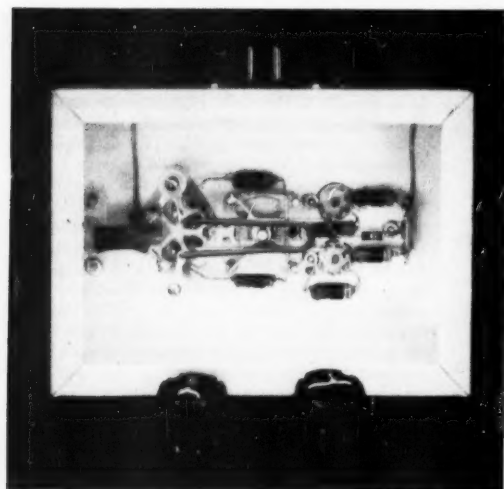
Fig. 1 — Evolution of quarter-wave and half-wave linear tank circuits.

across its terminals, but we still may not be able to get up to 420 Mc. because of the effect of the tubes' output capacitance, shown as C_o in dotted lines. Tube designers can keep this small, but it's still a capacitive load across our tuned circuit.

We can connect C_1 part way down our tuned circuit to lessen its effect, and this is done in our tank circuit for 220 Mc. We can also eliminate C_1 entirely, as in the quarter-wave line, Fig. 1C. Here we adjust the tuned circuit by means of a shorting strap, leaving only the tubes' capacitance loading the line. This will get us a little higher in frequency, but it has the disadvantage of being rather difficult to handle, mechanically and electrically.

The upper limit of frequency is reached when L_1 is a direct short between the tube plates. The circuit may still work after a fashion, but it will be inefficient and difficult to couple to after L_2 ceases to have a loop form. We have one more trick, however, before we give up trying to go higher in frequency: the half-wave line, shown in Fig. 1D.

Here plate voltage is fed to the line at the point where the short was connected in C, but we use r.f. chokes so they do not load the line down ap-



Bottom view of the oscillator unit, showing the two-band tank circuit. The line terminations, with their protecting caps removed, are in the foreground. At the left is the 220-Mc. plug, with the 420-Mc. one at the right.

preciably. We continue the line out to the next r.f. voltage peak, and put our tuning capacitor there. Only the tubes' output capacitance loads the portion of the line between the tube plates and the r.f. chokes. The chokes are connected at the point of minimum r.f. voltage, so the line is effectively a quarter-wave long from tube plates to r.f. chokes, and another quarter-wave from r.f. chokes to tuning capacitance. We couple to the line with L_2 , at the r.f. chokes, with the loop as shown, or on the other side of the chokes, with the open end of L_2 toward the tube plates.

This half-wave line dodge gives us a tank circuit that can be tuned conveniently and safely, yet its top frequency is considerably higher than is possible with preceding circuits. It works up to the point where the r.f. voltage null is right at the tube plate terminals, or even when it is part way down inside the tubes themselves. With the half-wave line, operation on 420 Mc. is possible with many tubes that will not go that high in frequency with the other circuits shown in Fig. 1. Keeping this explanation of the tank circuit techniques in mind will make the schematic diagram, Fig. 2, easier to interpret.

Other Circuit Features

The interesting part of our push-pull oscillator is the method by which the tank circuit is shifted from one type of line to the other. The line itself is made of two pieces of No. 12 wire, running from

the tube plate pins to Pins 1 and 5 of a standard 5-prong ceramic tube socket, J_2 . The line terminations, P_1 and P_2 , are 5-pin cable connectors, with their pins connected as shown at the right of the schematic diagram. For 220 Mc., Pins 1 and 5 are joined, to short the end of the plate line. The plate voltage is fed to this short through an isolating resistor. This plug is seen at the left of the bottom-view photograph. At the right of the same view is the 420-Mc. termination. In this one, Pins 2 and 4 are joined and plate voltage goes to this junction from Pin 3. Looking at the schematic diagram, we see that this leaves the end of the line open, applying the plate voltage through the two r.f. chokes, as in Fig. 1D. A common coupling loop, L_2 , serves for both bands.

The circuit is made to oscillate by keeping the heaters and cathodes of the tubes isolated from ground for r.f. by means of small hand-made r.f. chokes. Six of these are required. They are made by winding 12 turns of No. 28 enameled wire on 1-watt resistors of 10,000 ohms or more. The bottom view shows how they are placed.

The modulator uses a 12AX7 dual triode as a two-stage speech amplifier. The cathode of the second stage is left unby-passed, to introduce some negative feed-back. The extra gain obtainable by by-passing the cathode resistor is not needed. This stage is resistance-coupled to the 6V6GT modulator. The modulator is operated Class A, and is capable of up to 4.5 watts output

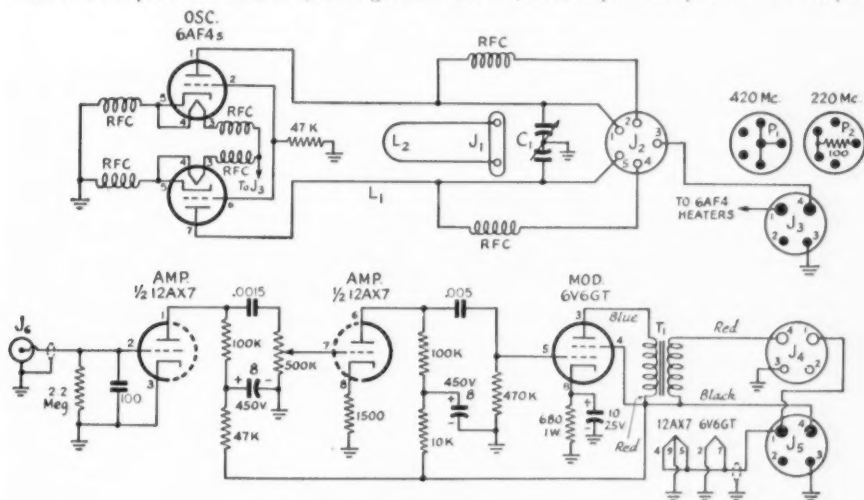
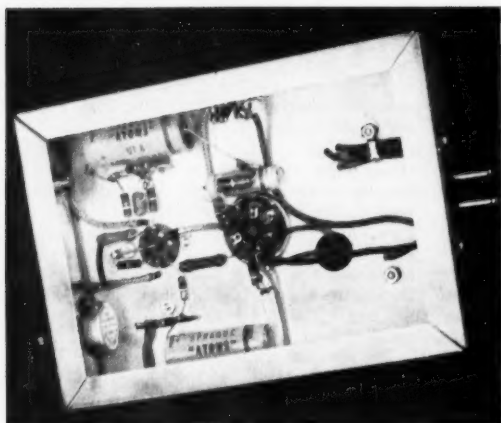


Fig. 2 — Schematic diagram and parts information for the two-band oscillator and modulator.

- C_1 — 10.5- μ f. per-section butterfly variable (Johnson 10LB15).
- L_1 — 2 3 $\frac{1}{2}$ inch pieces No. 12 tinned, spaced $\frac{1}{2}$ inch. Bend down $\frac{3}{4}$ inch at tube end and $\frac{1}{2}$ inch at socket end. R.f. chokes connect $\frac{5}{8}$ inch from bend at tube end. Connect C_1 at 1 inch from bend at socket end.
- L_2 — Hairpin loop 2 $\frac{1}{4}$ inches long and $\frac{1}{2}$ inch wide, No. 16, covered with insulating sleeving.
- J_1 — Crystal socket used for antenna terminal.
- J_2 — 5-contact ceramic socket (Amphenol 49-RSS5).

- J_3, J_5 — 4-contact male chassis fitting (Amphenol 86-RCF4).
- J_4 — 4-contact female chassis fitting (Amphenol 78-S4 or RS4).
- J_6 — Microphone connector (Amphenol 75-PCM).
- P_1 — 5-contact male cable connector (Amphenol 86-PM5) with Pins 2, 3 and 4 joined together.
- P_2 — Same as P_1 , but with Pins 1 and 5 joined. Connect 100-ohm resistor between these and Pin 3.
- RFC (6 required) — 12 turns No. 28 enamel close-wound on high-value 1-watt resistor.



Looking at the under side of the modulator.

with the 6V6GT. A 6L6 may be substituted to raise the output to about 10 watts, if the modulator is to be used with a higher-powered r.f. section.

Construction

Both the oscillator and the modulator are built on and inside $5 \times 7 \times 2$ -inch aluminum chassis (Bud AC-402). The input power fitting of the modulator is mounted on the rear edge of the chassis and the output fitting is on the right side. This is placed so as to plug directly into the input fitting on the oscillator and thus eliminate a connecting cable. The same pin connections are used for each fitting, allowing a power supply cable to be plugged into either unit. The blank pin (No. 2) may be used to supply unmodulated high voltage in case the modulator is used with a multistage rig.

The oscillator tuning condenser is centered on the chassis, and the tube sockets are mounted $1\frac{1}{4}$ inches away and 1 inch apart. The band-changing socket and the crystal socket which serves as an antenna fitting are $1\frac{1}{2}$ and 3 inches from the condenser, respectively.

The plate lines are made from $3\frac{1}{2}$ -inch pieces of No. 12 tinned wire. They are bent down $\frac{3}{4}$ inch at the tube end and $\frac{1}{2}$ inch at the socket end. The r.f. chokes are connected to the line about $\frac{5}{8}$ inch from the bend at the tube end. The tuning condenser is connected at a point 1 inch from the bend at the socket end.

The antenna coupling loop is $2\frac{1}{4}$ inches long and $\frac{1}{2}$ inch wide. It is made of No. 16 tinned wire covered with insulating sleeving, and fastened to soldering lugs which are mounted on $\frac{3}{4}$ -inch high ceramic pillars. A short piece of 300-ohm line, or a pair of stiff wires of similar spacing, is used to connect the loop to the antenna terminal. The heater and cathode r.f. chokes should be mounted as close as possible to their socket terminals. The jumper plugs are made from Amphenol power connectors. They are shown in

the bottom view of the oscillator, with the 220-Mc. plug on the left.

The modulator layout is not particularly critical, and exact duplication is not necessary. The gain control and microphone connector are mounted on the front, and the 12AX7, 6V6, and modulation transformer are laid out down the center of the top. Shielded wire should be used for the filament and 12AX7 grid leads to prevent hum pick-up. Two tie points are used to support the decoupling resistors for the speech amplifier stages. Any small modulation transformer having primary and secondary windings of about 5000 ohms will be satisfactory. If you get a multi-match unit like the one shown, the extra leads may be cut off short or curled up for future use.

Adjustment and Operation

The oscillator should be checked out first. Apply 6.3 volts and see that the 6AF4s light. Now connect a No. 47 (brown bead) pilot lamp across the antenna terminals, and insert the 220-Mc. plug. Apply 100 to 200 volts to the oscillator through a 50- or 100-ma. meter if one is available. The lamp should light if the unit is oscillating. Another check is to touch a pencil lead to the tube end of the plate line. (Use a wooden pencil!) If there is oscillation, the plate current will fluctuate as this is done. The frequency may be measured with an accurately calibrated grid-dip meter or wave-meter, or with a Lecher-wire system as described in the Measurements chapter of the *Handbook*.² The center of the band should fall near the middle of the tuning range. If it does not, bend the lines closer together to raise the frequency or farther apart to lower it.

Now operation on 420 Mc. should be checked. Insert the proper plug and again check for oscillation. The point of connection for the r.f. chokes should also be checked. Move a pencil lead along the line until the least effect on output and plate current is observed. This is the low r.f. voltage point, and the correct place for the chokes. Lecher wires will probably be necessary for frequency measurement on this band, since suitable wavemeters are not common. The frequency should be near the middle of the band with the same condenser setting as for 220. If not, the "tracking" may be adjusted by changing the point at which the condenser is tapped on the line. This should be set so that it is only necessary to switch plugs to change bands.

Now connect the power cable to the modulator unit, and plug the two chassis together. Connect

(Continued on page 188)

² Construction and operation of Lecher wires are also detailed in QST for November, 1953, page 38.

Using the B.F.O. as an Interpolation Oscillator

An Inexpensive Method of Checking Between 10-Kc. Points

BY R. R. CAMPBELL,* W4DFR

• While the idea of using the receiver b.f.o., or a similar substitute, for measuring frequencies in between 10-ke. multivibrator points is not new, it is a system that is too frequently neglected. It provides a means, at little expense, for the ham who does not need or have interest in measurement down to the last cycle.

IN MAKING accurate measurement of frequencies in the amateur bands, serious difficulty is seldom encountered in getting down to 10-ke. intervals, employing the usual 100-ke. crystal oscillator, and a 10-ke. multivibrator. It is only when an attempt is made to interpolate between 10-ke. points that high accuracy becomes hard and expensive to attain. A good audio-frequency oscillator covering a range of 5 or 10 ke. is both costly and difficult to build and calibrate. So, the average ham builds a VFO in the h.f. range, calibrating it at 10-ke. points with the multivibrator and interpolating between points. But it is seldom that high accuracy can be assured with this system because of the difficulty encountered in reading the dial accurately.

A much better interpolation oscillator, often overlooked, is the b.f.o. in the communications receiver. Most of the better present-day manufactured receivers can be depended upon to maintain good stability for a period of at least a minute or two, even without voltage regulation.

To use the b.f.o. for interpolation purposes, the b.f.o. is set in the middle of its tuning range. The receiver is then tuned to the signal whose frequency is to be measured. At this point, there should be three signals well within the audible range—the signal of unknown frequency, and a 10-ke. multivibrator signal on either side of it. Without touching the b.f.o. tuning, the receiver should be tuned to zero-beat the unknown frequency. Then, without touching the receiver tuning, the b.f.o. should be adjusted to bring the nearest multivibrator signal to zero beat. The change in b.f.o. frequency necessary to bring the multivibrator signal to zero is the difference between the standard and unknown frequencies.

As an example, suppose the unknown frequency is found between the 3550- and 3560-ke. multivibrator points. The unknown frequency can be compared with either of these two points, but usually the one having the lower beat note will be chosen because it will be stronger on a

selective receiver and more easily identified. After tuning the unknown to zero beat with the receiver tuning control, the b.f.o. is adjusted to bring the nearest multivibrator signal to zero. If we find that it has been necessary to change the b.f.o. frequency by 3.27 ke., this will be the difference between the unknown frequency and the frequency of the nearest multivibrator signal. If the signal is found closer to 3550 ke., the unknown will be $3550 + 3.27 = 3553.27$ ke. If it is closer to 3560 ke., the unknown will be $3560 - 3.27 = 3556.73$ ke. It will usually be less confusing if, as soon as the unknown has been zeroed, it is cut off (by disconnecting the antenna, or turning off the unknown if it is locally-generated), and then zeroing the nearest m.v. signal.

To make such a reading, it is only necessary that the b.f.o. be tunable over a range slightly

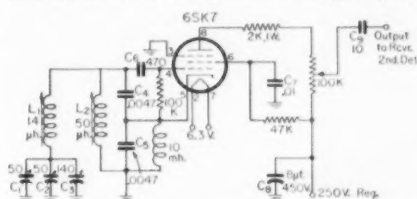


Fig. 1—Suggested circuit of a b.f.o. interpolator for 455-465-ke. i.f. receivers.

C₁—Zero-temp. fixed or trimmer.

C₂, C₃—Air variable, heavy plates.

C₄, C₅, C₆, C₇—Silvered mica.

C₇—Disk ceramic.

C₈—Electrolytic.

L₁—Slug-tuned coil, 9-18 μh. (North Hills 120-D).

L₂—Slug-tuned coil, 30-64 μh. (North Hills 120-F).

exceeding 10 ke., centered on the receiver's i.f. frequency, and be fitted with a good vernier dial accurately calibrated. The signal will always be within plus or minus 5 ke. of the nearest 10-ke. point.

Lacking other means, the b.f.o. can be calibrated from WWV's tone-modulated signal (see schedule in November, 1954, *QST*). First, with the b.f.o. dial set at the center-zero point, tune in WWV to zero beat with the 440-cycle sideband. (It is easier to do this if a crystal filter in the sharp position is used.) After marking this calibration on the b.f.o. dial, it should be possible to find a second weaker zero beat at 880 cycles, and perhaps a third, at 1320 cycles. When these points have been calibrated, the b.f.o. should be tuned to the other side of the carrier, and similar calibrations made against the opposite set of sidebands. Other points out to 1800 cycles either side

*Grand Theatre Bldg., Lenoir City, Tenn.

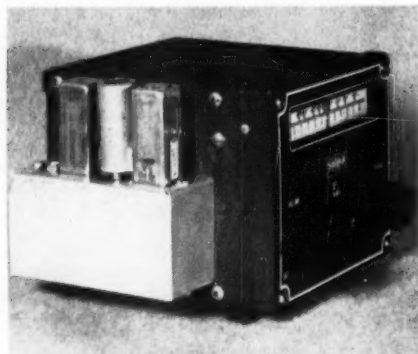
(Continued on page 124)

Double Conversion Attachment for 2-Meter Receivers

Outboard Modification for Improved Selectivity and Signal-to-Noise Ratio

BY M. K. BRETZFELDER,* W2JPX

MANY of the two-meter receivers available in the open market are being used under conditions for which they were never designed, to the detriment of good communications. A mobile v.h.f. receiver can well stand being unselective, in the interest of both easy tuning and the holding of a station under road shock conditions. The receivers in mind are those using single conversion and with a reasonably high interme-



The double-conversion unit mounted on the side of a Sonar SR-9 144-Mc. receiver.

diat frequency having from five to eight circuits tuned to this intermediate frequency. When such receivers are used at fixed locations, they leave much to be desired, especially if such locations are adjacent to heavily traveled highways, or in areas where 2-meter activity is heavy. Civil defense control centers are often so located.

Such a receiver, in a location overlooking a busy thoroughfare, will suffer excessively from ignition noise if it is too broad.¹ Also, in a c.d. net, such as is used in Westchester County, N. Y., a broad receiver is subject to bad adjacent-channel QRM from near-by towns when communication was attempted with a distant Central Control Station. The writer has had personal ex-

*7 Glen Eagles Drive, Larchmont, N. Y.

¹ The author's statement seemingly is at variance with the well-known fact that noise limiters are less effective with selective receivers than with broad ones. However, a noise limiter can be effective only if the noise consists of short pulses, comprising only a minor part of the total reception time. When noise pulses become so closely spaced that they lose their impulse character and become a solid blanket of noise, as can happen when the ignition noise from many vehicles is picked up at once, a selective receiver will show a better signal-to-noise ratio than a broad one. —Ed.

perience with the Sonar SR-9 and the Eldico MR2, both of which were designed for mobile use. He has examined the Robert Dollar 226 and suspects that it will perform similarly to the aforementioned sets. Using a Sonar SR-9 at Larchmont, overlooking the busy Boston Post Road, communication with County Control at White Plains, only 5 miles distant, was impossible except with a beam antenna and even then signals were washed out when the traffic lights changed. White Plains, using an Eldico MR2, could not operate generally around the county unless a near-by flashing neon sign was shut down. At both locations, a sharp receiver insured one hundred per cent communication.

Of course, the answer to adequate sharpness is a low intermediate frequency. This leads to image trouble so double conversion is required. A minimal change within the receiver to be improved is desirable. Putting most of the added parts and circuitry in an outboard box will simplify the job. An example of how this can be done is the following conversion of a Sonar SR-9.

Changes in the Receiver

The original circuit of the i.f. stages of the several converted Sonar receivers is shown in Fig. 1. Incidentally, this circuit is at some variance with the one shown in the Sonar Technical Manual. It was decided to keep one stage of i.f. at the original 10.7 Mc. and transform one stage to 455 kc. The converter circuits were built into a Bud CU 3002 Minibox, 4 by 2½ by 1½ inches in size, hung on the side of the receiver.

The last i.f. transformer was removed from the receiver and replaced with a similar-sized unit for 455 kc. Then the interstage coupler, consisting of L_1 , C_1 and C_2 , was removed. The resistors in the grid circuit of the second i.f. tube were left in the circuit so as to simplify the a.v.c. wiring. Except for the voltage-dropping resistor on the VR tube and a possible cathode resistor referred to in later remarks on stabilization, this constitutes the entire modification to be made inside the receiver.

Building the Conversion Unit

All of the components were mounted on one lip of the U-shaped section of the Minibox. The center section of the box goes against the left side of the receiver. The 10.7-Mc. i.f. can that was removed from the receiver was mounted toward the front end of this lip with the grid and B+ terminals next to the converter tube.

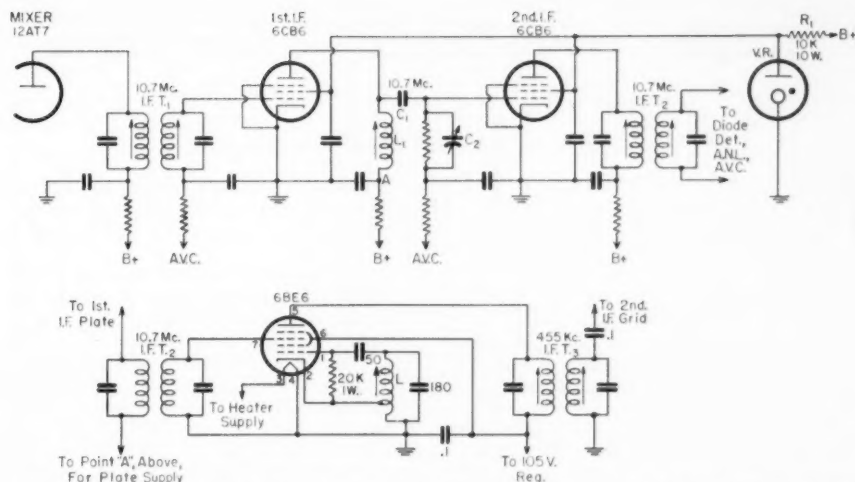


Fig. 1—Original diagram of the Sonar SR-9 amplifier system, above. The first stage is left on 10.7 Mc. in the conversion process. The 6BE6 converter to 455 kc., below, follows, and the second stage is converted to a 455-kc. amplifier. The original output transformer, IFT₂, is used for the 10.7-Mc. input to the 6BE6. Other changes are described in the text.

L is 7 turns $\frac{3}{4}$ inch long on a $\frac{3}{8}$ -inch slug-tuned form, tapped at $1\frac{1}{2}$ turns. It resonates at 10,245 kc.

Next in line toward the rear comes the socket for the 6BE6 converter tube. Mount this so that Pin 7 can be soldered directly to the grid pin of the i.f. can. Next in line comes a 455-kc. i.f. can with the plate and B+ pins nearest to the tube. Beyond this is mounted the slug-tuned oscillator coil. In mounting all of these components be sure to allow clearance for the lips on the cover of the box. On the opposite lip of the box, drill a pair of $\frac{1}{4}$ -inch holes in line with the centers of the two i.f. cans to accommodate an alignment tool for the bottom adjustments. The small parts can now be wired in place.

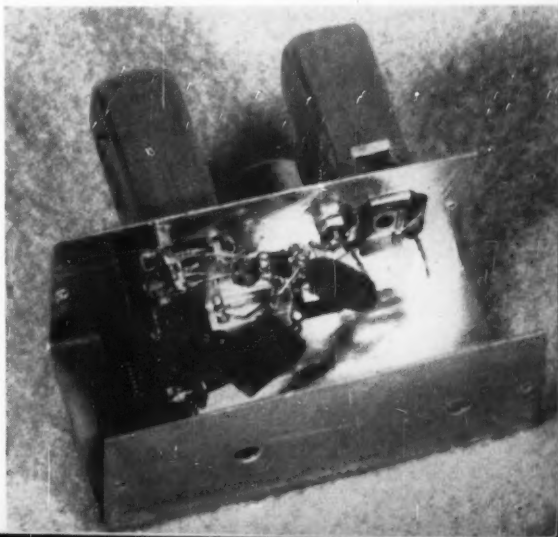
Two No. 33 holes can be drilled in the bottom of the U section to mate with the present chassis supporting screws on the left side of the receiver case. Locate these holes sufficiently far from the bottom edge so that there is room for the interconnecting wires to go into the set below the

chassis lip. The outboard unit is now mounted and is right alongside the receiver i.f. amplifiers for short interconnecting leads. Through both boxes, drill five holes, about $\frac{3}{16}$ -inch diameter, to accommodate the interconnecting leads. These should have protectors of spaghetti where they pass through the walls of the boxes.

The plate lead from the 10.7-Mc. transformer goes nearest the front and connects to Pin 5 of the first i.f. tube. Then bring the B+ lead from this transformer to the terminal strip lug from which L₁ was removed. Then the grid lead from the 455-kc. transformer, with the coupling condenser in series, is brought to the grid, Pin 1 of the second i.f. tube. Keep the coupling condenser within the converter box. Inside the receiver dress this lead away from the leads to the 10.7-Mc. can. Farther rear, the hot heater lead

(Continued on page 124)

Interior view of the double-conversion unit.



Simple Crystal-Controlled Converters

Compact Units for Mobile or Fixed Stations

BY W. W. DEANE,* W6RET/KR6MO

• In the issue of *QST* for November, 1952, the author described a simple crystal-controlled converter for 10 meters. In response to many requests, this article tells how the converter can be altered to cover other bands.

In the November, 1952, *QST*¹ an article was presented by the writer pertaining to a crystal-controlled 10-meter converter. The 10-meter band leaves much to be desired these days and, in response to many inquiries, it was de-

serves as an oscillator-mixer. There are no tuning controls and, after initial adjustment has been completed, the converter can be mounted out of the way.

The original circuit has been modified slightly to improve the oscillator action (C_6) and eliminate some occasional oscillations generally resulting from high 6AK5 screen voltage (R_2). The layout of the components and general construction remain the same as originally presented, and as shown in the accompanying photographs. The converter is constructed on a $2\frac{1}{4} \times 2\frac{1}{4} \times 5$ -inch chassis-type box. The power is

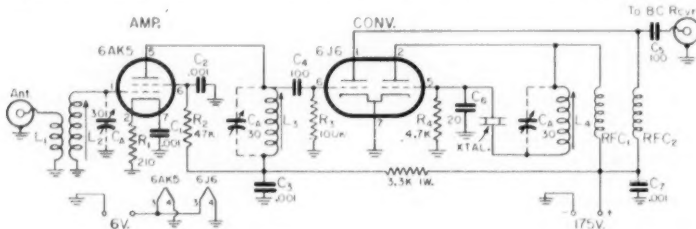


Fig. 1 — Circuit of the simple crystal-controlled converter. C_A is a 30- μ mf. mica trimmer, used only with the coils indicated in Table I. All other capacitors are disk ceramic. Capacitance values below 0.001 μ f. are marked in μ mf. All resistors are $\frac{1}{2}$ watt unless otherwise indicated. RFC_1 and RFC_2 are described in the text and in Fig. 2. Coil dimensions are given in Table I.

cided to expand the original unit to cover any band from 75 to 10 meters.

Circuit

The circuit diagram is shown in Fig. 1. A 6AK5 operates as an r.f. amplifier, and a 6J6

* 4524 Fountain Ave., Los Angeles, Calif.

¹ Deane, "Simplifying the 10-Meter Crystal-Controlled Converter," *QST*, Nov., 1952.

Top view of the simple crystal-controlled converter, showing tubes and crystal.



taken from the car or home-station receiver. The power-supply voltage should be limited to 175 volts by means of a series resistor in the high-voltage lead. The unit draws approximately 20 ma. RFC_1 and RFC_2 are made by breaking the leads between the second and third pies of a four-pie 2.5-mh. r.f. choke. This center-tap lead is connected to B-plus, and each end of the choke

This bottom view of the crystal-controlled converter shows the distribution of small components.

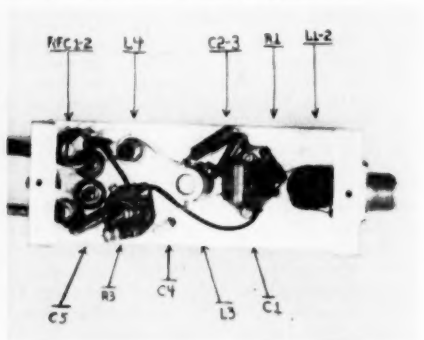


Table I

Me.	L_1	L_2	L_3	L_4	C_A	Wire
28	2 t.	20 t.	22 t.	26 t.	no	22 enam.
27	2 t.	22 t.	24 t.	28 t.	no	22 enam.
21	2 t.	22 t.	22 t.	22 t.	yes	22 enam.
14	4 t.	25 t.	25 t.	28 t.	yes	30 enam.
7	7 t.	45 t.	45 t.	none*	no	36 enam.
4	13 t.	100 t.	100 t.	none*	no	36 enam.

NOTE: All coils are wound on $\frac{3}{8}$ -inch iron-slug forms (CTC LS-3). *Crystal connected directly to plate.

connects to one plate of the 6J6, as shown in the sketch of Fig. 2.

Special care should be taken to adjust the coils (see Table I) with a grid-dip oscillator so they peak in the band selected and not just close

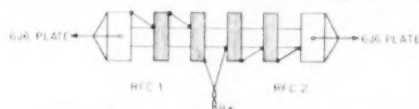


Fig. 2—Sketch showing details of the construction of RFC₁ and RFC₂.

to it. This makes the difference between a so-so converter and a good one. To obtain the band coverages listed in the coil table, crystals must be selected as listed in Table II.

Table II

Xtal (Kc.)	Osc. (Mc.)	Rever. (Kc.)	Band (Mc.)
7000	28.0 ¹	550-1550	28.55-29.55
6600	26.4 ¹	550-1000	26.95-27.4
6800	20.4 ²	600-1100	21.0-21.5
6700	13.4 ³	600-1000	14.0-14.4
6400	6.4	600-900	7.0-7.3
3200	3.2	550-800	2.75-4.0

¹ Fourth harmonic of crystal frequency.

² Third harmonic of crystal frequency.

³ Second harmonic of crystal frequency.

Alignment

Alignment is quite simple. The oscillator can be checked on any communications receiver covering the band selected. Plug in the crystal, and tune the receiver to the frequency listed in the second column of Table II, and adjust the slug of L_4 and C_A (when required) for maximum indication on the receiver S-meter. Inductances L_2 and L_3 can be adjusted for maximum noise or, if a signal is available, L_2 may be adjusted for maximum signal on the low end of the band, and L_3 for the high end.

Don't confine the unit strictly to mobile use. When operated with a surplus ARC-5 broadcast receiver, this makes a satisfactory unit for fixed-station operation.



M. A. R. S.



Major Flint Becomes Chief, MARS (Army)

Major Willard Flint (A4BNY), U. S. Army Signal Corps, has been assigned Chief, Military Affiliate Radio System (Army), with headquarters



Major Willard Flint, Signal Corps, Chief of the Military Affiliate Radio System (Army), inspects transmission tape of President Eisenhower's United Nations Day message to radio amateurs and short-wave radio listeners prior to the transmission from Army and Air Force joint MARS station at the Pentagon, Washington, D. C., on October 24, 1954.

in Washington, D. C. Major Flint previously was assigned in the Communications Planning Branch of Army Communications Service Division, Office of the Chief Signal Officer.

A native of South Yarmouth, Mass., the new Chief, MARS, is a licensed amateur radio operator, W4BNY; he is also custodian of station KAUSA, located on the concourse of the Pentagon Building, Washington, D. C.

Major Flint served during World War II as a Signal liaison officer with the Chinese Army. Assignments since the war have included such diverse duty as Signal Corps instructor, Reserve Officers Training Corps, at Oklahoma A. and M. College, Stillwater, Oklahoma, and Signal Corps liaison officer with the Turkish Army, with headquarters at Ankara.

As Chief, MARS (Army), Major Flint is responsible for the establishment and control of the Army program for training U. S. amateur radio operators who are interested in military radio communication, and in furnishing policy guidance for military commanders in the establishment and use of MARS radio nets for disaster or emergency communications.

Major Flint also will serve as Secretary of the MARS Advisory Committee, a policy-recommending body with representation from the Armed Services, Federal Communications Commission, Federal Civil Defense Administration, American National Red Cross and the American Radio Relay League.

Notes on Grounded-Grid R.F. Power Amplifiers

Circuit Details, Operating Conditions and Linearity

BY T. H. PUCKETT,* WSJXM/1

• The grounded-grid or cathode-driven amplifier is a useful type for triodes because it can be used without neutralization. Because the circuit has had relatively little use in amateur transmitters, most of us are not familiar with its other features — some of which differ greatly from what we are used to in conventional amplifier operation.

QUITE a few grounded-grid linear amplifiers are in use in single-sideband circles these days, but practically no information is available as to the operating conditions used and the circuit peculiarities observed. It was therefore decided to run some tests on a few tube types that seemed fitted for the purpose and see just what could be done, particularly along the high-power line. The four types tested were the 4-125A, 4-250A, 813 and 304-TL.

The Basic Circuit

For those unfamiliar with the grounded-grid circuit, the basic arrangement is given in Fig. 1A

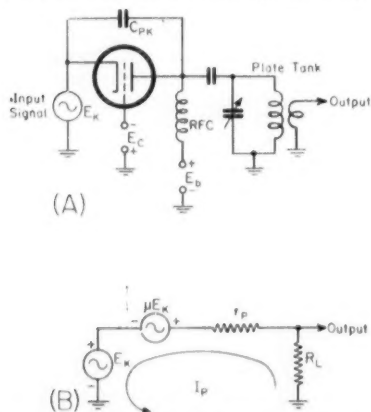


Fig. 1 — The grounded-grid amplifier circuit (A) and its small-signal equivalent circuit (B).

and the small signal equivalent circuit in B. The form of A is suitable for r.f. amplification. (The input circuit is not shown, but will come in for discussion later.) The driving signal is applied to the cathode of the tube, the grid terminal is grounded for a.c., and the output is taken from

*Technical Department, ARRL.

the plate circuit in the usual fashion. This may be compared with the conventional grounded-cathode circuit shown in Fig. 2. The primary advantage to be gained by using the grounded-grid circuit is that the grid acts as a shield between the input and output terminals of the amplifier

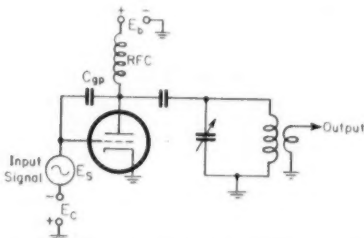


Fig. 2 — The grounded-cathode amplifier circuit for comparison with Fig. 1A.

(the cathode and plate of the tube, respectively) making the neutralization and stabilization problems much easier to handle. This may be seen by noting in the grounded-grid circuit that the primary coupling between the input and output is only the relatively small cathode-plate capacitance C_{pk} , while in the grounded-cathode arrangement the coupling is through the usually much larger (in triodes) grid-plate capacitance C_{gp} .

As a confirmation of the expected improved shielding, none of the tubes tested required any neutralization at all. It was necessary to eliminate the usual v.h.f. parasitic, but even this was easy, probably for the same reason. The methods of parasitic suppression are exactly the same as for grounded-cathode amplifiers.

Fed-Through Power

A feature of the grounded-grid circuit is that the output load current, which is also the tube current, must flow through the input signal source. This current is indicated as I_p in Fig. 1. It may be shown that this results in more power being required from the driver than for a comparable grounded-cathode amplifier. The driving power required commonly ranges from about one-tenth to one-half of the output power. However, there is some compensation in that most of the extra power from the driver simply passes through the amplifier and appears as useful power in the load.

This may be seen from Fig. 1B, if it is taken that the μE_k voltage is not present, which corresponds to the tube being present but having no

amplifying action for some reason, such as reducing the plate voltage to zero, but leaving a continuous path for plate current to flow. The input voltage E_k will then act as plate supply of sorts, causing a current flow in the plate circuit even though the d.c. plate-to-ground voltage is zero. This current will act as a regular tube current, and give an output signal. Some of the input power will be dissipated in the equivalent plate resistance r_p , but the effective load resistance R_L is usually much larger than r_p , and so will receive most of the input power. This of course neglects the losses at the grid of the tube, but these are usually small with respect to the amount of power fed through the tube, particularly for high-amplification tubes such as tetrodes which normally require only a small driving power as compared with their output power.

Input Coupling

In the practical application of the grounded-grid circuit, one other matter sometimes gives difficulty—just how to couple the driver power into the cathode. A simple cathode is indicated in Fig. 1, but in higher-power tubes this would actually be the filament. Or, if there is a separate heater, the heater-cathode capacitance would cause the heater to be at practically the same r.f. potential as the cathode. If the heater is to be supplied from a grounded source such as the regular 115-volt a.c. line, it is necessary to isolate it so that the driving source will not be grounded through the heater supply.

Probably the most obvious solution is that indicated in A of Fig. 3, in which the filament power is fed through r.f. chokes. (The tank circuit shown for coupling in the input signal is a common circuit, but any of the ordinary coupling methods, properly applied, should be satisfactory.) In this case, things are fine so long as not too much filament current is required. However, for the tubes under consideration here the filament current is large, and the wire size required to avoid excessive losses is embarrassingly big. The situation may be alleviated somewhat by using the filament chokes as the cathode tank inductor, but when using a tube such as the 304-TL, which requires 12.5 amperes, things may still be a little tough.

Another possibility is to use a filament transformer with a low interwinding capacitance, as indicated in B. The interwinding capacitance is shown as C_i . So long as this is less than the required tank capacitance, things will be fine. There were some of these transformers kicking around in surplus, from radar sets.

A third possibility is indicated in C. Here regular chokes are used, but in the input side of the transformer. The current will be stepped down in the same ratio that the voltage is stepped up, so a much smaller wire size may be used for the chokes. Of course, the transformer must be mounted so that its frame is insulated from ground. The capacitance of the transformer to ground will be added across the input, but this is usually pretty small. A filament transformer

measuring about 3 by 3 by 4 inches was mounted $\frac{3}{4}$ inch off a large metal plate, and the measured capacitance was about 25 μf . This method was used for these tests.

Although the data to be presented were taken on 80 meters, one run was made on 20 meters to see if anything unexpected would occur. In this case it was particularly desired to check if the method of driver coupling would be satisfactory on the higher band. The driver had a pi-network tank and was coupled to the grounded-grid amplifier by simply feeding the output of the pi tank directly into the cathode of the grounded-grid amplifier without a separate cathode tank of any kind.

This was initially tried as the simplest possible scheme, and worked beautifully. The impedance looking into the cathode seems to be in the vicinity of 50 to 100 ohms, since several lengths

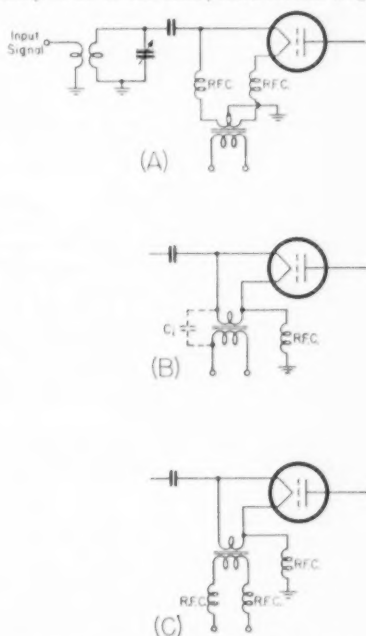


Fig. 3—Methods of isolating the filament or heater for r.f., to prevent grounding the hot side of the driving source.

of 72-ohm coax were inserted between the driver and the amplifier without causing the least difficulty in loading the driver. This and the other features of the grounded-grid amplifier showed no particular change when the shift was made from 80 to 20 meters.

Tetrodes

The question arises as to what to do when the tube is not a triode as indicated in Fig. 1. In all cases, the extra grids were grounded for r.f., the same as the control grid, with any necessary bias fed in separately. Thus the extra grids of the

tube are driven along with the control grid.

If it is attempted to use a tetrode in the normal fashion, with the screen circuit returned to cathode, it is necessary to drive the screen grid along with the cathode. The screen-plate capacitance will then act as a coupling between the input and output, destroying the shielding action of the control grid. The same thing applies if the tube has a suppressor grid. Actually, the procedure of grounding all the grids just makes multigrid triodes out of the tubes.

Operating Conditions

No information is available from the manufacturers on grounded-grid operation of the power tubes commonly used by amateurs. However, such ratings as maximum allowable plate dissipation and maximum current and voltage still apply. The operating points to be given are ones which happened to be convenient, and, of course, are not the only ones which can be used. They are intended to indicate the possibilities more than anything else. Generally, the ratings from the tube manuals for grounded-cathode operation seem to be good starting points for grounded-grid operation. Simply set the amplifier up with the indicated voltages, and adjust the drive and plate loading for the desired results.

An unexpected bonus cropped up when it was found that the 4-250A and the 813 made excellent zero-bias tubes. That is, all the grids are directly grounded, and the plate voltage is adjusted to give the desired no-signal plate current. The plate voltage may be anything less than the value which results in rated plate dissipation. In linear amplifiers, it is probably desirable to keep the voltage high enough to give as much no-signal plate current as is safe. The drive and loading are then adjusted in the usual fashion.

Admittedly, adjusting the plate voltage is not always convenient. An autotransformer in the a.c. input to the high-voltage power supply is ideal. Another possibility is a small buck-boost transformer in series with the input. Luckily, the voltages required are about what is normally used on these tubes. Using this zero-bias mode requires more driving power, but against this may be placed the quite large convenience of not needing any separate power supplies for the grids. This is particularly advantageous in the case of the control grid, since for linear operation its bias must be well regulated.

The actual numerical data are given in Table I.

These values were obtained using a modulated driving signal which had a low duty cycle, so that the average dissipation ratings would not be exceeded. These values may *not* be used continuously, as when plate modulating the grounded-grid stage. However, the values should be quite satisfactory for peak conditions when the stage is used as a linear amplifier in single-sideband work with speech input, since in this case the average signal is much less than the peak signal.

It was not possible to check the efficiency of the system directly, but observations of d.c. input, tube color and relative output indicated that the efficiency was in the normal region of 60 to 70 per cent.

Of the four tubes, the 4-125A was the only one which did not perform too well. As a zero-bias triode, it was not possible to get enough idling current through it, and the plate dissipation went up very rapidly with drive. It is possible that further investigation might turn up a more suitable set of operating conditions for this tube.

The 4-250A and the 813 performed about the same, within the limitations of the 813 maximum ratings. It is possible to run quite a bit more input than indicated to the 4-250A, but the required driving power increases pretty rapidly. It was necessary to be a little bit more careful about shielding the input and output circuits from each other with the 813, and it is recommended that the 813 base shell be solidly grounded by the use of metal spring clips or the like.

The 304-TL cannot be used as a zero-bias tube. The grid-bias requirement is a major difficulty, as the tube has such a low amplification factor that 150 to 200 volts bias is needed to keep the no-signal plate dissipation within reason when 2000 volts is used on the plate. In view of this and the filament current requirement, the thing that makes the tube of interest in this application is the fact that many people picked them up at low prices in surplus. Also, if driving power is available, the tube may be driven to very large inputs.

The 304-TL was the only tube of the four that needed more than a small v.h.f. inductor in the plate lead to suppress parasites. A coil of 8 turns of No. 16 tinned wire, $\frac{1}{2}$ inch in diameter and $\frac{3}{4}$ inch long, with a 100-ohm carbon resistor tapped across half of the coil, was used in the

(Continued on page 128)

TABLE I

	E_b Volts D.C.	I_p (No Signal) Ma. D.C.	E_s Volts D.C.	E_{scr} Volts D.C.	Driving Power Required Watts	Plate Input Watts	I_c^* (D.C. Ma.)	I_{scr}^* (D.C. Ma.)
4-125A	2000	15	0	0	150	330	100	60
4-250A	3000	50	0	0	540	1600	200	100
813	2500	40	0	0	450	1000	75	10
813	2500	40	-60	500	270	1000	5	40
304-TL	2000	50	-185	—	290	1100	75	—

* Approximate.



Hints and Kinks

For the Experimenter



STARTING HARD-TO-GET-AT MACHINE SCREWS AND NUTS

WHEN the needle-nosed pliers are too cumbersome, and the fingers are too clumsy, try starting a machine nut as follows:

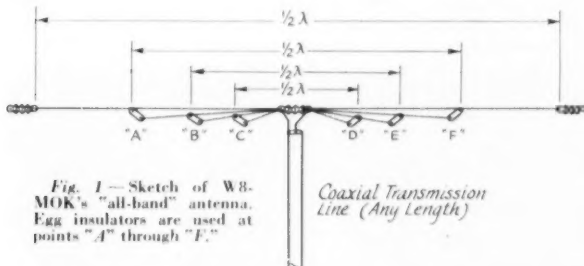
Press the eraser of an ordinary pencil momentarily against the barrel of a hot soldering iron. Stick the nut to the melted eraser and then use the pencil to poke the nut in place; a screwdriver will do the rest. — *Frank Joseph, WN9AOI*

WHENEVER difficulty is encountered in getting screws, washers and nuts into tight corners, it is possible to solve the problem by wrapping a couple of turns of masking tape, sticky side out, around the end of a pencil. Any small piece of hardware will stick to the tape long enough to allow completing the job on hand. — *Joseph J. Kosina, W2LGG*

"ALL-BAND" ANTENNA

FIG. 1 is a sketch of an "all-band" antenna system that I have been using with success for some time. The idea is not a new one, having appeared in *QST* at least 10 years ago. However, I feel that there are many newcomers since that time who would be interested in a simple system that can be fed with a single 70-ohm transmission line.

The arrangement consists of dipoles, cut for each band and connected in parallel at the center. Although I have not checked standing-wave



ratios, the results seem to indicate that it gets out as well as a bunch of individually-fed dipoles. If you haven't tried it, you're in for some surprises.

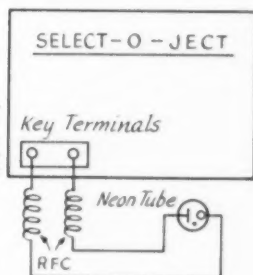
— *R. L. Cope, W8MOK*

[EDITOR'S NOTE: As with any system of this type, special care must be exercised in reducing low-order harmonic output, since any harmonic energy fed to the system will be easily radiated.]

USING THE SELECT-O-JECT AS A KEYING MONITOR

ANYONE who owns and operates one of the National Select-O-Jects may be interested in how the unit is used as a keying monitor here at WNØRVF. The stunt has worked out so well that

Fig. 2 — Arrangement employed by WNØRVF to permit using a Select-O-Ject as a keying monitor.



earlier plans to build a more complex monitor have been given up. The system employs a Select-O-Ject keyed by a small neon tube as shown in Fig. 2. The r.f. voltage that is used to ignite the bulb is obtained by placing the tube in the r.f. field of the transmitter output amplifier. Lead length between the bulb and the S-O-J is not critical and unshielded wire has been used to date. However, r.f. chokes should be connected in series with the leads and should be placed as close as possible to the key terminals of the S-O-J. The frequency of the tone fed to the 'phones when the transmitter is keyed may be varied by means of the Select-O-Ject frequency control. My own experience with the monitor is that it follows keying without lag and reacts to bug keying much more favorably than some of the systems which employ relays to obtain the same effect.

— *Tom Bakersmith, WNØRVF*

REMOVING HOT TUBES

THERE is probably nothing new about this idea but even so it can bear repeating. A simple method for removing hot tubes from "hard to get at" places is to wind a rubber band around each of the jaws of an ordinary pair of pliers. This makes an excellent tool for gripping and removing the tubes.

— *Lewis G. McCoy, WHCP*

• Recent Equipment —

The 500-W Power Amplifier

In the past, one was likely to think of an r.f. power amplifier as something that came as part of a complete transmitter he bought, or perhaps as something one built to boost the power level of an existing station. But the fashion is definitely changing, and you can now buy an amplifier as a separate unit, with or without power supply. The growth in popularity of single sideband is a prime reason for this change — many who got their s.s.b. feet wet on low-powered “barefoot” excitors want to increase the power level. Since the amplifier is of necessity a “linear” one, running in Class AB₁ or AB₂, there will be design features that did not appear in the earlier commercial r.f. amplifiers that ran only Class C. The Gonset 500-W Power Amplifier is an example of some of the novel features and engineering we can expect to see. It can be used for any mode of transmission: c.w., a.m., s.s.b., f.m. or f.s.k.

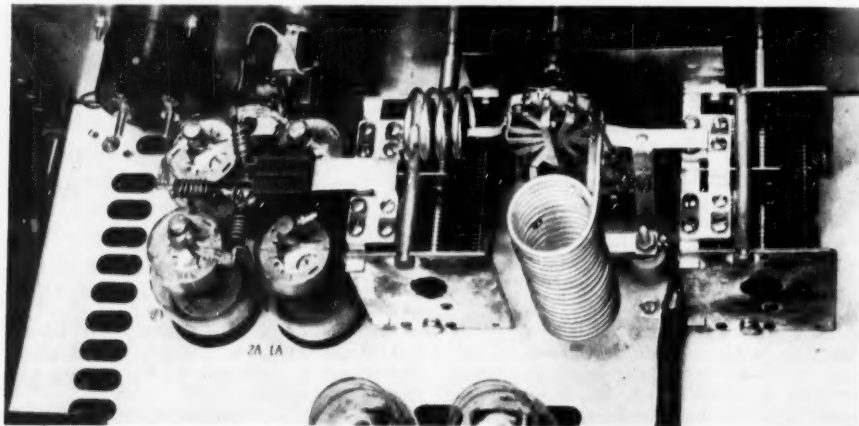
The linear amplifier is a complete package in a cabinet 23 inches wide, 13 inches high and 16½ inches deep, designed for a table-top location. It is bandswitching from 80 to 10 meters, with an “X” position on the switch for the optional 160-meter operation that is available. The single bandswitch knob controls both grid and plate circuits. Other panel controls include Grid Tuning, Grid Drive, Plate Tuning, Coarse Output Tuning, Fine Output Tuning, and power and meter switches. The Plate Tuning dial is marked directly for the various bands, to simplify resetting from one band to another without the need for referring to a chart. The Power switch is a three-position affair: Off, Fil and Plate — to permit warming up the rig be-

fore applying plate power. A green pilot lamp indicates when the filaments go on, and a red light is added when the switch is thrown to the “Plate” position. The meter switch allows metering of the cathode currents of the r.f. tubes individually, total grid current, and r.f. output voltage delivered by the amplifier. The output-voltage indication has two ranges, to allow for various output-impedance levels. Input and output jacks on the rear of the chassis are standard coaxial-connector fittings.

The 500-W uses four 807s in parallel, a feat that might be considered impossible by many amateurs who have struggled with only a pair of the little beasties. However, the problem was licked by a couple of constructional tricks that can be seen in the photographs and will be described shortly. The four 807s have a parallel-tuned grid circuit, with the input line tapped up on the coil instead of being connected to a separate coupling winding. The Grid Drive control is a switch that cuts in various amounts of “swamping” resistance across the grid circuit, as shown in Fig. 1. The plate circuit is the conventional pi-coupler arrangement, with the bandswitch determining the amount of inductance in the circuit. The output voltmeter uses a 9006 diode rectifier — the range is changed by inserting resistance in series with the meter.

As can be seen in Fig. 1 and one of the photographs, each 807 has a fuse in its cathode circuit, to protect the power supply and to allow operation without interruption in the event of a tube failure. Subsequent location of the bad tube is

The Gonset 500-W linear amplifier uses four 807s in parallel to deliver 250 watts peak envelope power. The individual suppressor resistors and chokes connected in the plate circuit can be seen here, as well as the heavy silver-plated straps used for low-inductance connections. Two of the four rectifier tubes can be seen in the foreground.



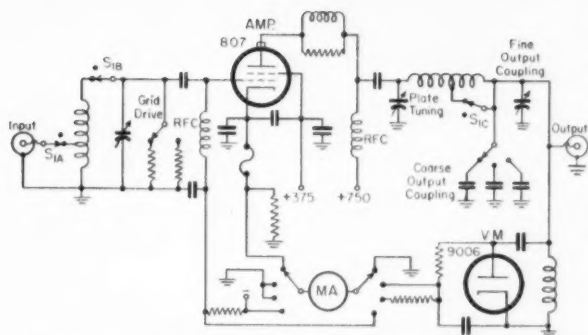


Fig. 1 — A simplified circuit diagram of the 500-W linear amplifier. Four 807s are connected in parallel, but only one is shown here. Each of the four tubes has individual screen and cathode by-passing. For simplicity, coils for all bands are not shown, but the grid circuit uses separate coils for each band (80 through 10 meters) and the plate circuit uses a tapped coil in series with a fixed (10-meter) coil. Notice the fuse in the cathode circuit and the output-level voltmeter.

simplified by the individual fusing. Another protective device is an overload relay in the common screen-grid lead to the power supply. When the total screen current exceeds 40 ma., as it might with light loading or excessive drive, the overload relay drops out, which increases the grid bias and also turns out the green pilot light. The increased bias will, in most cases, decrease the screen current sufficiently to let the relay fall back, and the result is "cycling" of the relay and a flashing of the green lamp, for as long as the overload condition exists.

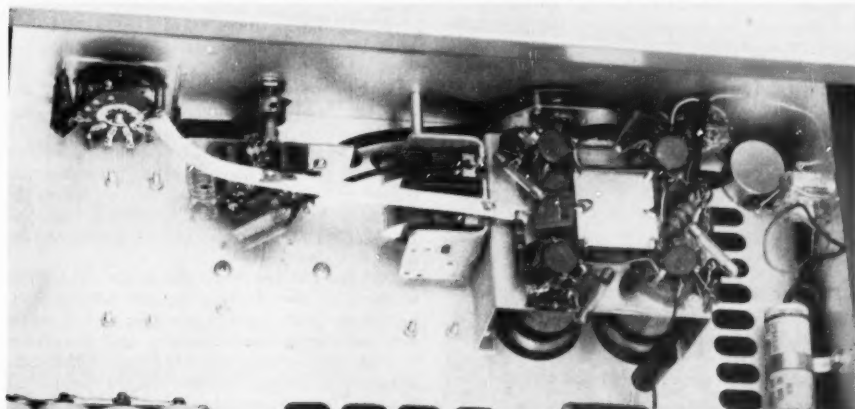
The power supply uses four 866 Jrs. in a bridge circuit, to supply 750 volts for the plates and 375 volts for the screens of the 807s. The 750-volt supply has an 80- μ f. output condenser, and the screen supply has 160 μ f. in the output. These high values of capacity are in keeping with current thinking about linear amplifiers, where the object is to build a high degree of dynamic regulation into the power supply. A selenium rectifier

is used in the grid-bias supply. For those who might wonder at the selection of four 807s in parallel for this amplifier, it should be pointed out that this results in the equivalent of a beam power tetrode having a plate dissipation of 120 watts, a transconductance of around 25,000, and full output at relatively low plate voltage. The constructional tricks, mentioned earlier, that permit this parallel operation without instability consist mainly of reducing the inductance of the common connecting leads. This was done by using heavy silver-plated connecting straps wherever necessary. And apparently another policy was "Don't spare the condensers," as can be seen by the generous by-passing at each socket. The currents of the 807s can run between 15 and 30 ma. without excitation, but they should match to within a 10 per cent spread at around 100 ma. with the tubes heavily loaded. Thus an important point in running four tubes in parallel is to match the cathode currents at full load and drive conditions, and ignore the wider variations in no-signal currents. If the four tubes do not match closely enough at full load, the errant tube is easy to replace. Tolerances on tubes permit wide variations but the low cost of 807s makes matching easy. Wide variations in tubes in the amplifier will degrade the linearity and reduce the potential output, so it is well worth while to match tubes.

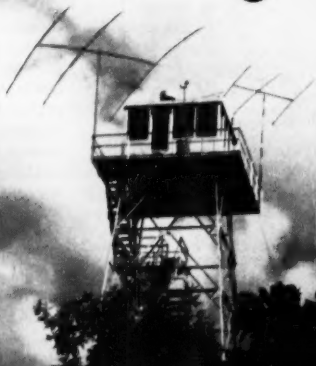
The amplifier is designed to work into 52- or 72-ohm coaxial cable having an s.w.r. of 2 or less, but it can handle them up to s.w.r. = 5 under most conditions of line length.

(Continued on page 132)

Attention-getters under the chassis are the components and connections at the tube sockets. The square plate and heavy strap is the common control-grid lead. Each tube is individually fused in the cathode circuit.



Field Day— 1954



— Photo courtesy W4SRX/4

Number Participating Soars to 8380; 585 Clubs and Groups, 234 Portables and Mobiles Afield

BY PHIL SIMMONS,* WIZDP

"Somebody fix 40 c.w.'s key clicks. We hear 'em all over 10 meters." . . . "Anyone gassed the generator lately?" . . . "Where's Joe Züch? He's supposed to be logging at Position Two." . . . "Look alive, fellows, we're 50 QSOs behind this time last year." . . . "Quick, kill the gear! The line voltage is up to 140!" . . . "Now who went and sat on my sandwich!"

Such comments will ring a bell to anyone who's been on a Field Day outing. The grammar may not be impeccable, but these remarks typify that peculiar lingo which besets Hamdom every June as regular as clockwork. They reflect the joys and the woes, the trials and tribulations — they're part and parcel of every ARRL Field Day.

The first Field Day in 1933 wasn't exactly a howling success, it would seem. Just forty-one stations reported results. This was long before the advent of mobiles, of course, and the less stringent regulations for portable operation that presently prevail. And imagine trying to knock off 20 QSOs an hour using those Federal Radio Commission portable calls like W9ZZAO and W2ZZDI. At any rate, there was little evidence that Field Day would catch hold to the extent that thousands of individuals and clubs would bring about that annual ham-band cacophony.

* Communications Assistant, ARRL.

Some groups lay careful plans for months in advance of the big day, others hold off until an hour before the opening gun. But whatever the means or degree of preparation, the emphasis is on the more serious aspect of Field Day, that of demonstrating that amateur radio is ready, willing and able to cope with a *real* emergency, be it flood or windstorm, hurricane or bomb attack. Judging from the quantity of newspaper clippings reaching ARRL, Field Day received a copious amount of "before and after" publicity — the kind that gains public support for amateur radio.

So hats off to every Field Day participant! Hats off to the boy with the 5-watt battery-powered peanut whistle who went up on the mountain and made five contacts all by his lonesome, and to the lucky mobileer who only had to climb into the family jalopy and call CQ FD. Hats off, too, to those multitransmitter installations with the club-owned generator and dozens of people helping out on the operating, maintenance, cooking, and what-have-you. Yes indeed, hats off to *every* Field Day participant for a job well done!

Like each of its predecessors, the 1954 affair smashed all previous records, with 8380 individuals in the field. Entries representing 819 portables and mobiles were received, and there were at least 2026 separate receiver-transmitter combinations operating independently of commercial mains. Those figures don't include the signals

pouring forth from home stations, either. Yes, FD has proven once again that for sheer popularity it has no peer amongst ARRL-sponsored operating activities!

For purposes of our QST report, competition is considered to be among stations employing similar numbers of simultaneously-operated transmitters. Final scores are therefore tabulated according to the number of transmitters at each station. For purposes of geographical comparison in Class A, the following clubs and groups led in their respective licensing areas:

W1OC/1	9009	KL7CC/KL7	1195
W2LI/2	17,847	KP4HD/KP4	1500
W3PKV/3	12,177	VE1FO/1	3321
W4MK/4	7398	VE2NI/2	3582
W5SC/5	10,113	VE3BRR/3	7848
W6UW/6	11,874	VE5AA/5	1092
W7DK/7	5679	VE6NQ/6	1569
W4FU/8	14,355	VE7AQL/7	4038
W9AP/9	13,230	VE8GY/8	756
W0CET/0	5364	VO1X/2	1128
KH6WO/KH6	1764		

The Tri-County Radio Association of Plainfield, N. J., whose members have posted astronomical FD scores for years, did it again in '54, this time leading all entrants. With 30 watts or less to ten simultaneously-operated rigs, each of which used a 6146, an 807, a 1625, a 2E26 or

TEN HIGH SCORES

Class A	Class B
W2LI/2 17,847	W2JBQ/2 5373
W2GSA/2 16,899	W5VRP/5 2916
W4FU/8 14,355	W6VIF/6 2903
W9AP/9 13,230	W4KUX/4 2835
W3PKV/3 12,177	K0WBB/0 2763
W6UW/6 11,874	VE3BCL/3 2547
W9IT/9 11,241	W6LDR/6 2538
K0BAG/6 11,065	W1RAN/1 2502
W2VDJ/2 10,917	W6RSU/6 2049
W9PCS/9 10,584	W3WPY/3 1980

S32A final, thirty ops rolled up 17,847 points at Mountainside, N. J., under the call W2LI/2. Doublets were available for 3.5 and 7 Mc., a doublet and 2-element beam for 14 Mc., and 3- to 10-element beams for 21 through 144 Mc. Receivers were 3 HROs, 2 75As, 2 Super-Pros, and an SX-28, with converters on a Super-Pro and SX-28 handling 6 and 2 meters. A 6-kw. generator powered the gear. A breakdown of W2LI/2's 1958 contacts: 324 on 80 c.w., 304 on 75 'phone, 319 on 40 c.w., 185 on 40 'phone, 152 on 20 c.w., 128 on 20 'phone, 58 on 15 'phone, 238 on 10 'phone, 33 on 6 'phone, 217 on 2 'phone.

These happy Hawaiians, flanked by the verdant scenery of Oahu, earned 1764 points in Class 1A at KH6WO/KH6, led all KH6 entrants. *L. to r.:* KH6DQ, KH6ARM, KH6RU, KH6AN, KH6WU keying, KH6AHO, KH6KC, KH6AS. The 100-watt p.p. 807s were powered by a 2-kw. generator.



An integral part of most Field Day excursions is gassing the generator. Here W9UHV obliges by doing the pouring as W9AIN assists. These and 23 other Hoosiers polled 2076 points with W9RDI/9 in the one-transmitter category. The 3-kw. job on the trailer as well as the spare 500-watter at the right are the property of the Tri State Amateur Radio Society.

Honors for the second-highest score go to the Garden State Amateur Radio Association's W2GSA/2. Forty GSARA enthusiasts set up shop at Hazlet, N. J., earning 16,899 points and 1979 QSOs, tops in the contact department. Except for the 80-c.w. and 20-'phone installations, rigs were kept in the low-power bracket. The W2GSA/2 contact total by bands looks like this: 377 on 80 c.w., 236 on 75 'phone, 250 on 40 c.w., 190 on 40 'phone, 276 on 20 c.w., 158 on 20 'phone, 3 on 15 c.w., 54 on 15 'phone, 1 on 6 c.w., 48 on 6 'phone, 254 on 2 'phone. *Wow!*

Ohio Valley Amateur Radio Association, long renowned for its exploits in various operating activities, ran true to form in the Field Day, bringing home the third slot with 14,355 points and 1570 stations worked. Utilizing seven transmitter-receiver combos and the call W4FU/8, OVARA plowed all spectrum portions 80 through 2 (except 11 meters, which no one ever seems to tackle any more) and qualified for the 9 multiplier by employing generators and low power.

Moving to one- and two-operator stations, we find W2JBQ/2, aided and abetted by W2FBA, leading Class B with 5373 points and 373 QSOs on 20-, 40-, 80-meter A1 and A3. A VFO-2E26, a Super-Pro, a 14-Mc. ground-plane and a couple of folded dipoles comprised their modest set-up near Scottsville, N. Y. Storage batteries furnished



the juice. Other outstanding Class B scores: W5VRP/5 2916, W6VIF/6 2903.

Spearheading the record 167 mobile entrants was the 3551-point tally of K6ASK/6. On Mount Wilson near Pasadena, K6ASK and K6KBT worked 'phone exclusively, logged 238 contacts with the Harvey-Wells transmitter, Elnac receiver, and car whip.

Cleveland's Westpark Radiops, almost quadrupling their '53 showing, continued undisputed mastery of the mobile aggregate category, turned in 77,918 points. Top score of the 48 club members on the air from their individual mobiles was W8HFE/8's 3470 points. A prime reason for the success of these Ohioans is the fact that each station originates that FD message (worth up to 337.5 score points), and many receive and relay from 30 to 40 such messages. Standings of all clubs that entered the mobile aggregate classification appear in a separate tabulation accompanying this report.

A half-dozen QSTs could perhaps be filled with the interesting experiences and incidents which FDers recounted on their logs. ARRL is pleased to pass along as many of these sidelights as space will permit.

FD Quotes

"We expected some success from our quarter-wave 7-Mc. vertical but were really amazed at the performance of the odd-length (40-foot) vertical on 14 Mc. Eight or more radials were staked from the base of each vertical. DARC old-timers admit this was the club's most enjoyable FD. They still remember last year when at zero hour it was discovered that the generator ran off butane, and there was no butane!" — *Dallas Amateur Radio Club, W5FC/5*. . . . "We cured terrible QRN from the generator ignition by placing a 50,000-ohm resistor in the main distributor lead. Only one member had seen the site before we arrived Saturday A.M. to set up camp." — *Collingwood Amateur Radio Club, VE7DJ/7*. . . . "The 'phone team certainly came through when the chips were down. The c.w. ops not only lost prestige but now have to buy steak dinners for the participating 'phone gang." — *Narragansett Association of Amateur Radio Operators, W1SKT/1*. . . . "Our surplus generator was found to be full of rust in its gas tank and gas lines; plugs would not fire and the carburetor leaked. We fixed it up before FD, but what if it had been a real emergency! Clubs: See that your c.d. equipment is properly maintained and ready for action at all times!" — *Lima Area Amateur Radio Club, W8GYM/8*. . . . "Our score dropped this year, but we didn't do too badly considering we had over an inch of rain and an S9 noise level. We did work KA2IM, and we are proud of our operators for doing such a fine job under difficult conditions." — *Twin City Contest Club, W0HAM/0*. . . . "Our six ops went without sleep for nearly the full period. Atmospheric conditions were poor and it was necessary to change bands frequently, which caused us to lose valuable operating time." — *Midland Amateur Radio Club, W6QGG/5*. . . . "Our power source was a 1-kw. alternator belted to a 1951 Ford engine, with d.c. excitation for the

alternator derived from a bank of storage batteries. We were off the air only briefly to replace two fouled spark plugs in W3IDQ's faithful buggy. Our site, Beach Haven on Long Beach Island, was chosen because of supposedly high ground conductivity as evidenced by RCA and other overseas transmitters in the near-by area." — *Beacon Radio Amateurs of Phila., W3DYL/2*. . . . "Despite bugs, heat, forgotten equipment and a sagging 750-foot-per-leg Vee of #12 soft-drawn copper wire (which had to be tightened five times), our club had a grand time." — *Northwest St. Louis Amateur Radio Club, W0BJT/0*. . . . "Surprised to work Falkland Islands via North Pole. A 100-foot lookout tower served as an ideal antenna support." — *Tualatin Valley Emergency*

CLUB AGGREGATE MOBILE SCORES

Westpark Radiops.	77,918
Norwalk Amateur Radio Club.	19,849
Maryland Mobile Radio Club.	12,802
Associated Radio Amateurs of Long Beach.	11,842
North Seattle Amateur Radio Club.	11,424
Mobile Amateur Radio Club of South Bend.	6870
Wisconsin Valley Radio Assn.	2268
Lake Washington Amateur Radio Club.	2079
Lockheed Amateur Radio Club.	1311
Johnson County Radio Amateurs Club.	752
Philadelphia High-Frequency Radio Club.	635
Waltham Amateur Radio Assn.	356
Connecticut Wireless Assn.	252
Coffee Dunkers of Detroit.	68

Radio Club, W7OTV/7. . . . "All our members in the military services obtained week-end passes and we planned our FD at the last minute, setting up all gear just prior to going on the air at 5 P.M. — no doubt the closest thing to an emergency operation we ever accomplished. We thoroughly enjoyed FD, disassembled the station by 5:30 Sunday, and within a few hours were all on our way to our various military posts." — *Abington Township Amateur Radio Assn., W3PSH/8*. . . . "Static charges were so strong during a local storm that it was a trick to attach a feeder without getting a jolt. Our ground-plane antenna was supported by two balloons when the vertical wire broke, but luckily no one was hurt." — *Society Radio Operators, W8NGI/9*. . . . "Heavy rains limited operations." — *Minneapolis Radio Club, W0WET/0 (!)*. . . . "All stations making any sizable number of QSOs should keep an indexed, alphabetical listing of stations worked to prevent repeats. We didn't but will certainly do so next year." — *Madison County Wireless Club, K2APT/2*. . . . "Our first participation as an organized club and we're already waiting to set up the equipment in '55. Excitement: a large moose stood 100 feet from our tent giving us the eagle eye but fortunately didn't investigate further." — *Anchorage Amateur Radio Club, KL7AA/KL7*. . . . "Believe we are the only FD entrants that operated from a defunct u.h.f. TV station. We used office space for the shack and tied our antenna to a 300-foot TV tower." — *Elmira Amateur Radio Assn., W2LJ/2*. . . . "Weather was most uncooperative. At 1825, Saturday, operation was disrupted by a tornado. Within two minutes after the first warning was received the station was completely dismantled. Normal operation was resumed by 2000. On Sunday an electrical storm accompanied by driving rain again curtailed our operations for two hours. After a feverish 11th-hour attempt, we succeeded in relaying our message five minutes before the deadline. FD here proved a valuable lesson in emergency operation under decidedly adverse conditions." — *Maumee Valley Radio Association, W8HIF/8*. . . . "Viking and 32V rigs operate well at low power if primary of high-voltage supply is fed through variable autotransformer, resulting in plate voltage of 300-400 volts. 32Vs have connection on terminal board at the back for this; Vik-



It's "Alley Oop," Mount Suribachi style, in the Chino Hills near Pomona, Calif., as Aerojet Radio Amateurs Club members sedulously apply themselves to hoisting the 30-meter skywire for K6CLZ/6.

QST for

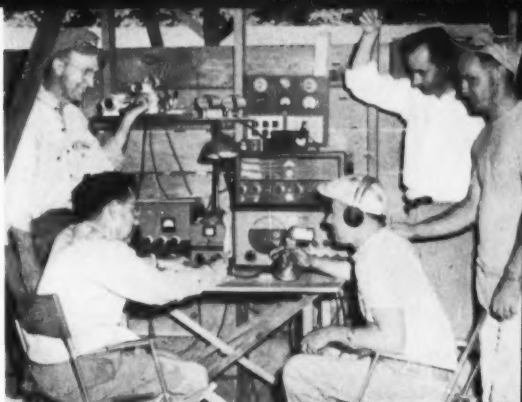
"Though operating from a cow stall and beset by the stentorian moos of its bovine inhabitants, this team nevertheless milked 75 meters for 187 contacts. Left to right, we have W1s LFF WJ LWA WQU and TRJ, of the Narragansett Association of Amateur Radio Operators. The club grossed 4461 points with WISKT/1 in Class 3A.

ings require connections brought out." — W9ERU/9. . . . "Forced to shut down for short periods due to lightning crashes around antennas. At one time six inches of water was running like a river through our tent. All in all it was a very good test under emergency conditions." — Racine Megacycle Club, W9UDU/9. . . . "We had to run special lines from the generator to our two electronic keys because the voltage drop was too great for them to work properly." — Radio Amateurs of Erie County, W2EUP/2. . . . "This event was the first for the newly-formed Radiation Lab Radio Club of Johns Hopkins University. We set up one tent on the parking lot of the famed Pimlico race track, and used a borrowed 750-watt Onan gasoline generator. The call used, W3SSE/3, was drawn from a hat. Many of the gang were Novice operators who gained valuable experience. This was my twentieth straight Field Day and I would not miss one for all the world!" — W3LMC, club president. . . . "A helium-filled balloon kept our vertical an average 100 feet above terrain." — Dit Happy Dash Hounds, W3FQR/3. . . . "Our location was a hilltop adjoining the Baltusrol golf course where the National Open was in progress, and the path leading up the hill was completely blocked by parked cars. It took the help of the Springfield (N. J.) police to move them so we could get our heavy equipment up to the site." — W2KGZ/2. . . . "Complaint: Much



Field Day axiom: Keep the signal on the air at all costs! Above W8MQR does a hurry-up repair job on a temporary power supply for Sandusky Valley Amateur Radio Club's W8NCK/8.

time would be saved if FD voice operators would identify their stations properly. Most said 'W4XXX-slant-4' which is not even legal. Location given with call is required by FCC and would save many repeats." — W4GLW/4. . . . "If we could get a 0.001 multiplier for each chigger bite, our outfit would win hands down!" — W0BYC/0. . . . "We used ARC-5s which are handy and compact, and that single-dial control is the only way to move from place to place in a hurry. We've decided coax feed lines are a 'must'—the only time you hear the guy next to you is when you hit a harmonic." — State Line Radio Club, W2DTU/2. . . . "We used masts made by bolting 20-foot two-by-fours to 20-foot two-by-sixes, held fast by six guy wires. Our site was a cow pasture. At 3 A.M. we heard a terrific crash. A cow had 'spooked' at a flashlight and bumped into one of the masts, which fell and shattered into eight pieces. We finished the run with one 15-foot mast. P.S. The cow is okay." — Martinsville Amateur Radio Club, W9NTA/9. . . . "We all got cherry-red sunburns and learned too late that it always pays to measure the antenna. From now on we won't just throw up a piece of wire." — W6HJK/6. . . . "Fine time had by all, though the county weed-cutter took down all our antennas Saturday morning." — Central Texas Amateur Radio Club, W5ZDN/5. . . . "Twenty operators, lots good food, FB weather, no tech-



nical difficulties, good band conditions. Who could ask for more!" — Suburban Radio Club (St. Louis, Mo.), W0DCW/0. . . . "Vertical antennas on the low bands seem to pay off but should be used judiciously. Early Sunday A.M. we heard on 40 meters many signals we couldn't work. The reason—we decided later when wide awake—was that the transmitter was on vertical and the receivers were on horizontal antennas." — Columbus Amateur Radio Assn., W8TO/8. . . . "Our Vee beam, 1000 feet each leg, was pointed at New York City where we knew FD stations would be thick as flies. We were told constantly that we had the strongest sig on the 10- and 20-meter bands. It was a real dream to cut through the 20-phone QRM with 75 watts input. We cried like babies when it came time to take the Vee down." — Oil Capital Mobile Club, W5BBI/5. . . . "The XYLs brewed up a huge beef stew which we demolished in an early supper just before H-hour. So fortified, the gang ran through the night with much vim and vigor." — Falmouth Amateur Radio Assn., W1WNM/1. . . . "The one big mistake we made was operating under one tent with all equipment crowded on three tables. Key clicks from our own equipment caused loss of many almost-completed QSOs." — Andrews Electronics Assn., W8RV/8. . . . "One of our rigs, running about 10 watts input and with practically no output, used a 63-foot wire which led to the top of the tent, was looped around the main support, and then laid in branches 6 feet off the ground for the rest of its length. This little bomb worked more than 1000 miles on 80 and 40. No wonder everybody liked it!" — Eagle Rock Teen Age Radio Club, W6QV/6. . . . "The generator team required two men, one to fill it with gas and the other to ward off the rattlesnakes." — Naval Air Station Radio Club, W4NEK/4. . . . "Lost all antennas an hour before the start of FD in a sudden wind and rainstorm. We were using balloons that were guyed, but wind pressure forced the gas to the top of the balloons, which promptly blew up. What a mess!" — Coffee Drinkers of Detroit, W8AM/8. . . . "We suffered from lack of: extension cords, outlets, ground rods, insect repellent, crushed ice, and operators from 0100 to 0800. We suffered from excess of: insects, generator hash, key clicks, tangled wire, warm beer, and operators from 0800 to 1800." — Grand Island Amateur Radio Society, W0ELJ/0. . . . This club has never been a high scorer but we go all out for FD. Each year four large tents about 500 feet apart are erected in a city park. A centrally located 10-kw. gasoline generator feeds the tents, all of which are connected by field telephones. Our balloon-supported verticals attracted hundreds of visitors Sunday. We feel that the publicity ham radio receives is well worth the interference the visitors give our operators." — Baltimore Amateur Radio Club, W3PSG/3. . . . "We discovered at 0630 that our generator had been putting out 62-cycle a.c. and the electric clocks were gaining each hour. No more electric clocks for us!" — Jacksonville Amateur Radio Society, W4DU/4. . . . "A most wonderful time was had by all. An organized FD is a thing of beauty. Emphasis was placed on the training of our younger operators with a view toward offering some real competition in the future. Our rather unique 33-foot self-supporting vertical, located on a float in the lake and with its radials in the water, gave a good account of itself in 24 hours of 7-Mc. operation." — Port City Amateur Radio Club, W1WQM/1. . . . "The 7th consecutive year our club has participated and highest score so far, but the first time we didn't get our FD message off the hook. We made an effort to pass it Sun-



Just across the Indiana border at New Paris, Ohio, W9EZB (foreground) and W9PSD keep things humming for the Richmond Amateur Radio Association's W9PSD/8. The soldering iron appears to be in readiness for that almost inevitable FD exigency.

day P.M. but we gave up after two stations politely refused." — *Paso Robles Radio Club, W6BRY/6*. . . . "Use of a $3\frac{1}{4} \times 7\frac{1}{2}$ IBM card for each contact proved beneficial in eliminating duplications. Cards for each band-log were filed by the call letter after the numeral. Tab cards for each letter facilitated rapid locating. The more the contacts, the better the system works." — *Mount Diablo Amateur Radio Club, W6LUF/6*. . . . "Tables with interchangeable legs greatly helped in setting up. Each table was equipped with a plug-in strip, a Variae, and an a.c. meter. Forty-foot extension ladders were used as antenna supports." — *Old Colony Amateur Radio Assn., W1WKN/1*. . . . "Biggest turnout we've ever had — 64 operators. The fellows worked hard for the event and enjoyed testing emergency-powered low-wattage rigs." — *Rock Creek Amateur Radio Assn., W5RCN/3*. . . . "We operated FD on an island about 1000 feet in diameter and were able to ground all equipment exceptionally well because of damp ground just under the surface. Interference between positions was therefore greatly reduced." — *San Antonio Radio Club, W5SC/5*. . . . "The following FD stations heard in Hastings, New Zealand, between 1430 and 1600 NZT, June 20th, on 14 Mc.: W2s FPY LV OPY, K2AA, W3s NA NKM, W4s VTU YZC, W5s KFD SC UAO, W6s BIP CG HJK IY MBM MGJ OJ OT SFT TT UF, K6s BFI CQK EBN, W8s CCO CQY, W9s FTI JP OFR IQM, W9s EWH FLA OHP SLP 8X, KH6BFD, KP4ID, VE3BQG." — *ZL2ARL*.

. . . . "Greatest thrill was the excellent performance of our low-power transmitter. Our percentage of answers was close to 60 per cent, and average report received was 579X. The rig, designed by W2NC1 and built by W2GNT, consisted of a dual-range c.c.o. with a 6AK6 covering 80 and 40 meters and a 6BK5 final doubling on 40 and 20. A bandswitching pi network provided excellent flexibility. Power input to the final was 12 watts, provided by storage batteries and a PE101-C. A 6-volt vibrator furnished hash-free power for the NC-88 receiver. The complete station, except for batteries, was placed on a 20 x 36 foot operating table, with room to spare." — *W2NC1/2*. . . . "Amid dust, rain and wind, I still say FD is tops of all ARRL activities. Already looking forward to next year." — *W9ESQ/9*. . . . "Dipstick vibrated out on generator and we lost lots of oil before noticing the trouble." — *W5WQN/5*. . . . "Up until two months before FD I had made no plans to participate. The last time I honored FD with my shaky fist was four years ago in VE1-land. However, a growing awareness of the real purpose of FD began to overtake me. Here was an opportunity to field-test equipment that might be called into use in an emergency. With mounting enthusiasm, plans were made and equipment readied. There are few amateurs in the vicinity, so with an eye to the future, four potential operators were dragged to the wilderness of the FD site. The result is that we now know exactly what technical work has to be done for the next test, we have four aspiring amateurs, and our alternate communications for civil defense are going to be efficiently set up." — *VE2QI/2*. . . . "As both SEC and SCM of Idaho, I request that next FD I be allowed 25 points credit for receiving FD messages addressed

to me. How can I ever get 25 points credit for originating a message to myself?" — *W7WU/7*. . . . "W1DHX/1 and I exchanged 'light signals' for about 15 miles. He copied our fire tower on Mount Ascutney and I read his car lights solid. Is this a FD record?" — *W1MMN/1*. . . . "Just before FD I installed in the car a heavy-duty Bosch generator which is capable of the full charging rate at very low speeds, with the result that the battery was at full charge even at the end of FD." — *W6OLC/6*. . . . "The XY1, W6EHA, and I were mobile in motion for the entire period of operation, traveling 306 miles through the valleys and mountains of Los Angeles section. We wonder how many other mobiles-in-motion took part in Field Day." — *W6EHB/6*. . . . "My 49 QSOs were made during a FD drive through Utah, Colorado and Kansas. Very enjoyable." — *W7NVY/7 and /0*. . . . "We used the identical set-up which netted us top listing in the '53 mobile category, but were plagued with more complications this year. Heavy static and a severe storm, which toppled 50 TV towers in town, forced cessation of operation for almost eight hours. All considered, it is still a source of great surprise to learn what can be done with low power and nothing but a whip on the back of the car." — *W9RQM/9*.

SCORES

CLASS A

Scores are tabulated according to the number of transmitters operated simultaneously at each field station. The figures and letters following each listing indicate the number of contacts, the power or power inputs used, the number of participants at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 100 watts (multiplier of 2); C indicates over 100 watts (multiplier of 1). More than one letter indicates that at times power inputs fell within different classifications.

One Transmitter			
W1BDI/1	Connecticut Wireless Assn.	560-	A-11- 5274
W1KXM/1	Central Connecticut Contest Club	500-	A-15- 4725
W0HAM/0	Twin City Contest Club	452-	A-8- 4293
W5QGG/5	Midland Amateur Radio Club	418-	A-6- 3987
W0DU/9	Egyptian Radio Club	389-	A-6- 3726
W1EH/1	South Lyme Beer, Chowder and Propagation Society	608-	B-7- 3204
W3DYL/2	Beacon Radio Amateurs	324-	A-7- 3141
W6HGY/6	Whittier Radio 50 Club	298-	A-16- 2907
W8I/8	(nonclub group)	297-	A-10- 2898
W0BJT/0	Northwest St. Louis Amateur Radio Club	297-	A-12- 2898



"Br-r-r-r," you say, and justifiably so. Far from the cry of the mosquito, this fur-clad quintet manned VEBGY/8, the world's most northerly Field Day station, near the Arctic Ocean on Yukon's north coast. *Letter:* VE3AAS, W3VYR, VE3BRO, VE1QJ, W2YJL. The portable hamshack in the background is a wigan, or Arctic bunkhouse on runners. Each of VEBGY's 59 contacts was DX, there being no locals in these parts.

A black and white photograph of a man in a chef's uniform. He is wearing a tall white chef's hat with the number '277' on the front. He has a white short-sleeved button-down shirt and a white apron. He is standing in a kitchen, with a dark background and some kitchen equipment visible. He is holding a dark object, possibly a knife or a handle, in his right hand.

No, this isn't a 1954 Jack-the-Ripper. It's WTAZ, galley *charge d'affaires* for the Radio Club of Tacoma, preparing to serve up a toothsome repast to the hungry Radio Club of Tacoma crew. Roy's offerings must have been tasty indeed, as WTDK's 5679-point tally was tops for the W7 call area.

W2ALE/2	Columbia University	164-	B- 5-	378
VE8YT/8	Froelicher Bay Amateur Radio Club	125-	C- 4-	375
W8YN/8	Calhoun Area Radio Club	61-	B- -	366
W5TNR/5	(nonclub group)	33-	B- 3-	348
W4YMU/4	Anderson Radio Club	57-	B- 5-	342
KN6DVT/6	Helix Kilocytes	27-	A- 3-	312
W8HIF/8	Maumee Valley Radio Assn.	3-	A- 6-	252
W9AML/9	Central Illinois Radio Club	36-	B- 4-	216
W6NWA/6	El Dorado Amateur Radio Club	23-	A- 8-	207
W01A D/0	Gallatin Valley Amateur Radio Club	76-	B- 5-	202
W7R0X/7	(nonclub group)	33-	AB- 4-	201
W91AD/9	(nonclub group)	23-	C- 3-	69

Two Transmitters Operated Simultaneously

W3BES/3	Frankford Radio Club (one group of two)	983-	A- 6-	9072
W4MK/4	Richmond Amateur Radio Club	822-	A-30-	7398
W3KT/3	Frankford Radio Club (one group of two)	703-	A- 8-	6552
W1VB/1	Canewood Amateur Radio Assn.	504-	A-16-	4761
W3NMR/3	Lancaster Radio Transmitting Society	527-	A- -	4743
W2JC/2	Bloomfield Radio Club	492-	A- 8-	4653
W3CKJ/3	Antietam Radio Assn.	609-	AB-30-	4335
W9ERU/9	(nonclub group)	438-	A-11-	4167
W20DP/2	Irrington Radio Amateur Club	437-	A-25-	4158
W9UDU/9	Racine Motorcycle Club	430-	A-20-	4095
W0SLP/0	Hutchinson Amateur Radio Club	414-	A- 8-	3951
W48RX/4	Eglin Amateur Radio Society	405-	A-20-	3870
W80FW/8	Bacral Radio Club	403-	A-10-	3852
W9REJ/9	Tippecanoe Amateur Radio Assn.	538-	AB-20-	3609
VE2NI/2	(nonclub group)	398-	A- 8-	3582
W0YMU/0	South St. Louis Amateur Radio Club	527-	AB- 8-	3429
W6TO/6	Fresno Amateur Radio Club	352-	A-20-	3393
W2EUP/2	Radio Amateurs of Erie County	348-	A- 6-	3357
W4RLD/4	Middle Tennessee Radio Assn.	443-	AB- 8-	3336
K6CLZ/6	Aeroflex Amateur Club	448-	AB-18-	3207
W11NM/1	Providence Radio Assn.	393-	AB-15-	3198
W4R8S/4	Norfolk Naval Shipyard Amateur Radio Club	464-	AB-10-	3162
W3KX/3	Electric City Amateur Radio Club	346-	A-12-	3114
W4NC/4	Winston Salem Amateur Radio Club	501-	B-25-	3003
W21Q/2	(nonclub group)	306-	A-12-	2889
W0UNT/0	Lawrence Amateur Radio Club	438-	B-12-	2778
W6KMY/6	Pleasant Valley Amateur Radio Club	276-	A-15-	2709
W9NTA/9	Marlineville Amateur Radio Club	270-	A- 9-	2655
W20DV/2	Bayonne C. D. Amateur Radio Club	437-	B-10-	2622
W21WT/2	KRT Radio Club	390-	B-19-	2555
W8MAA/8	Central Michigan Amateur Radio Club	416-	B-15-	2496
W1HHO/4	Charleston Amateur Radio Club	387-	B-15-	2472
W5FC/5	Dallas Amateur Radio Club	311-	AB-16-	2472
W0TIU/0	Central Iowa Amateur Radio Club	386-	B-10-	2466
VE2CB/2	Verdun Amateur Radio Club	384-	B- 9-	2454
W0JOY/0	Prairie Dog Amateur Radio Club	374-	B-16-	2394
W4UWS/4	Rappalahannock Valley Radio Club	373-	B-14-	2388
W0MLV/0	Midway Amateur Radio Club	234-	A- 4-	2331
W61KO/6	Tamapais Radio Club	363-	B-12-	2328
W4MM/4	Palmetto Amateur Radio Club	378-	B-15-	2268
W1GB/1	New Haven Amateur Radio Club	316-	AB- 6-	2241
W7AQ/7	Yakima Radio Club	218-	A-20-	2187

W4ACA/4	(nonclub group)	358-	B- 3-	2148
W5UAA/5	Pittsburg County Amateur Radio Club	357-	B-10-	2142
W38SF/3	Radiation Lab. Radio Club	211-	A-12-	2124
K2DIE/2	Cowanessque Canisteo Amateur Radio Assn.	207-	A-16-	2088
K2ELD/2	Mid-Hudson Amateur Radio Club	323-	B- 5-	2088
VE7DJ/7	Collingwood Amateur Radio Club	204-	A- 6-	2061
W8FT/8	Findlay Radio Club	247-	AB-17-	2031
W8CIA/8	Louisville Amateur Radio Club	216-	A- 8-	1944
W7LAB/7	Ogden Amateur Radio Operator's Club	224-	AB-30-	1923
W8RYI/8	Kalamazoo Amateur Radio Club	215-	AB-15-	1923
W9DKR/9	Kokomo Amateur Radio Club	291-	B-25-	1896
W4FA/4	Jackson Radio Club	235-	AB- -	1890
W48UD/4	Owensboro Amateur Radio Club	453-	BC-16-	1842
W2GGN/2	Queens Radio Amateurs	278-	B- 9-	1818
W6BCY/6	Merced Amateur Radio Club	303-	B-15-	1818
W3FQR/3	Dit-Happy Dash Hounds	202-	AB- 6-	1671
W1HJL/1	(nonclub group)	198-	AB- 3-	1662
W3BYF/3	Allentown Mike and Key Club	225-	AB- 4-	1575
W6GRR/6	Bakersfield Technicians and Operators Club	235-	B- 8-	1560
W90SD/9	Triton Radio Amateur Club	254-	B-28-	1524
W7QII/7	Lower Yakima Valley Radio Amateurs	144-	A- 7-	1521
W2KGZ/2	(nonclub group)	202-	AB- 7-	1509
W6ADB/6	Mineral Wells Amateur Radio Club	179-	AB-13-	1488
W4UMV/4	Rock Hill Amateur Radio Club	201-	AB-25-	1478
W0GEY/0	Adams County Radio Club	237-	AB-12-	1425
W4LW/4	(nonclub group)	210-	B- 6-	1422
W0RHF/0	Band Hoppers Radio Club	180-	AB- 7-	1398
W5WH/5	South Plains Amateur Radio Club	189-	AB- -	1380
W3MKA/3	West Philadelphia Radio Assn.	224-	B- -	1344
W5FGE/5	Hattiesburg Amateur Radio Club	198-	B- 7-	1344
W0EDA/0	Rolla Amateur Radio Assn.	199-	B-12-	1344
W4YKY/4	Lake Amateur Radio Assn.	192-	AB-15-	1341
W48ON/4	(nonclub group)	147-	A- 3-	1323
K6CKQ/6	Mountain View Amateur Radio Club	192-	B-12-	1302
W3DD/3	Haverford Township Emergency Radio Net	213-	B-14-	1278
W4CHQ/4	Piedmont Amateur Radio Club, Spartanburg, S.C.	149-	A-15-	1269
W6ZGA/6	(nonclub group)	141-	A- 5-	1269
W8KEG/8	Tri State Amateur Radio Assn.	137-	A-15-	1233
W7TFQ/7	Hughes Amateur Radio Club	177-	B-10-	1224
W0LIJ/0	Muscataine Amateur Radio Club	136-	A- 7-	1224
W7QDM/7	Davis High School Radio Club	173-	B- 6-	1200
KL7CC/KL7	(nonclub group)	173-	B- 5-	1195
VE1NU/1	Gloucester Bay Amateur Radio Club	124-	AB-10-	1157
K6CEE/6	(nonclub group)	101-	A- 3-	1143
R16IX/R16	Hilo Radio Club	161-	B-20-	1116
W8QLY/8	Mahoning Valley Amateur Radio Assn.	334-	AC-10-	1098
W9WHL/9	(nonclub group)	120-	A- 7-	1080
W7EKA/7	(nonclub group)	117-	A- 3-	1055
W9NNS/9	Point Radio Amateurs	115-	A- -	1035
K2BGZ/2	Scholastic County Amateur Radio Club	118-	AB- 7-	1017
W0CJ1/0	(nonclub group)	140-	B-10-	990
W7TMZ/7	Shy-Wy Radio Club	74-	A- 9-	891
W0ILO/0	Red River Radio Amateur Club	99-	A- 5-	891
W7AHQ/7	Skagit Amateur Radio Club	148-	B- 4-	888
W7TZ/7	Grays Harbor Amateur Radio Club	147-	B-10-	882
VE2APX/2	St. Johns Radio Club	122-	B- 8-	882
W2BXK/2	Polytechnic Institute of Brooklyn Radio Club	89-	AB- 7-	879
W1TYM/1	Malden Amateur Radio Assn.	114-	AB- 7-	873
W4GLW/4	(nonclub group)	144-	AB-13-	867

The v.h.f. portion of South Jersey Radio Association's K2AA/2 racked up 245 QSOs on 144-Mc. 'phone. Shown (l. to r.) are W2JAV and W2EGP. Rig ran 30 watts to an 829-B and a 5-over-5 flop-over beam. Clubs that haven't already done so better fire up on 2 meters for a real score-booster! Competing in the four-transmitter class, SJRA got 972 contacts and 9099 points.

QST for

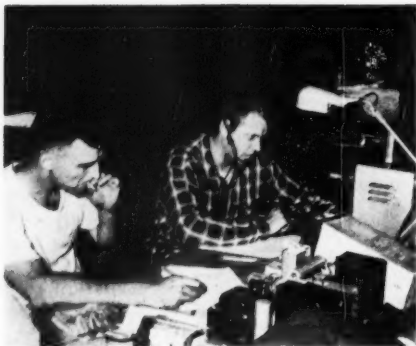


W0VQN/0	Tri-City Amateur Radio Club	104- AB- 6-	837	W1COB/1	Willmantle Radio Club	500- B-18-	3159
W00KA/0	Ottawa Radio Emergency Club	113- B- 3-	828	W5ABD/5	Westside Amateur Radio Club	497- B-13-	3132
W2SV/2	Sunrise Radio Club (nonclub group)	247- A-20-	816	W5DND/5	Temple Amateur Radio Club	482- B-15-	3108
W5ZYF/5	Fraser Valley Amateur Radio Club (nonclub group)	89- A- 3-	801	W9DUK/9	Delaware Amateur Radio Assn	492- B-15-	3102
W0HYC/0	Winona Amateur Radio Club (nonclub group)	88- A- 6-	792	W8RFH/8	Buckeye Shortwave Radio Assn	514- B-28-	3084
W01IK/0	Winona Amateur Radio Club (nonclub group)	167- ABC- 4-	786	W9HRM/9	Milwaukee Radio Amateurs' Club	398- AB-35-	3048
W92NA/9	Kishwaukee Radio Club	97- B-14-	768	W08XZ/0	Three Trails Radio Club	504- B- 9-	3024
W9TFM/9	Deles Radio Club	114- AB-10-	735	VE1GH/1	Sackville Amateur Radio Club	308- A- 9-	2997
W3DU/3	Huntsville Amateur Radio Club	175- AC-15-	693	W0DW/0	Suburban Amateur Radio Club	361- AB-20-	2988
W4HSN/4	Mt. Shasta Amateur Radio Club	53- AB- 8-	684	W3NEW/3	Capitol Suburban Radio Club	642- BC-20-	2937
W60ML/6	Cratonet Radio Assn.	98- B- 6-	684	W4AY/4	Nashville Amateur Radio Club	350- AB-20-	2925
W1VXL/1	Piedmont Amateur Radio Club, Salisbury, N. C.	72- A- 8-	648	W8TO/8	Columbus Amateur Radio Assn.	453- B-26-	2868
W8MOE/8	Mount Clemens Radio Club	138- BC- 4-	597	W3RQZ/3	Phil-Mont Mobile Radio Club	382- AB-30-	2862
W0UTL/0	Sekan Radio Club	189- C- 9-	567	W5IAS/5	Tulsa Amateur Radio Club	445- B-12-	2820
K2HJG/2	Harmonie Hill Radio League (nonclub group)	251- A-20-	552	W9YYJ/9	Elgin Radio Amateur Service Club	294- A-11-	2781
K3WAS/3	(nonclub group)	173- C-16-	519	W0EQY/0	Ak-Sar-Pen Radio Club	463- B-20-	2778
W8NXL/8	Ashtand Amateur Radio Club	56- A- 5-	504	W8YF/1	Newport County Radio Club	277- A-16-	2727
W8ECL/8	Thirteen Amateur Radio Club	74- B- 5-	444	W1ORS/1	Stratford Amateur Radio Club	358- AB-15-	2722
VE7SE/7	Southeastern Massachusetts Amateur Radio Assn.	68- B- 8-	408	VE7ARV/7	Vancouver Amateur Radio Club	301- AB-35-	2712
W1WKM/1	St. Paul Radio Club (nonclub group)	17- A-13-	378	W9NZ/9	Swan Amateur Radio Club	301- A-10-	2709
W01IA/0	81- Paul Radio Club (nonclub group)	150- B-12-	300	W1TRZ/1	Tri-County Amateur Radio Club	426- B-20-	2700
W2TFV/2	Iowa-Hillinois Amateur Radio Club	90- AC-25-	288	K6CX1/6	Alexander Hamilton High School Radio Club	302- AB- 6-	2691
W0QVA/0	Newberg Amateur Radio Club	85- A- 5-	255	W8UPN/8	Niles Amateur Radio Club	437- B- 7-	2622
W7MRW/7	Greene County Radio Club	41- AB-23-	249	W7RG/7	Tacoma Amateur Radio Society	341- AB-20-	2574
W9ZMF/9		25- A- 3-	225	W8AKA/8	(nonclub group)	303- AB-10-	2547
		9- B- -	18	W9KA/9	Chicago Radio Traffic Assn.	292- AB-14-	2523
<i>Three Transmitters Operated Simultaneously</i>				W5BRJ/5	Chi Capital Mobile Club	393- B-12-	2508
W21M/2	Sommerset Hills Radio Club	968- A-20-	8955	W6MSO/6	Inglewood Amateur Radio Club	386- B-15-	2466
W8BWA/8	Cleveland Brassponders Assn.	811- A- 6-	7524	W2QCX/2	Rochester Amateur Radio Assn.	485- BC-35-	2460
W8IC/8	Westpark Radio Club	516- A-40-	5751	W2NH/2	Staten Island Amateur Radio Assn.	438- AC- 3-	2457
W2MO/2	Livingston Amateur Radio Club	683- AB-18-	5631	W9CAF/9	Chicago Amateur Radio Club	248- A- 29-	2457
W2QYV/2	Niagara Radio Club	584- A-15-	5490	W5FQ/5	Meridian Amateur Radio Club	515- AC-10-	2394
W2FTU/2	State Line Radio Club	557- A-14-	5013	W1WNM/1	Falmouth Amateur Radio Assn.	238- A-10-	2367
K6FAV/6	Met Jellian Amateur Radio Society	632- AB-18-	4782	W2WQU/2	Walton Ham Group	263- A- 2367	
W2NOO/2	Radio Amateur Club of Belleville, N. J.	491- A-17-	4644	W5ZZZ/5	Copiah Amateur Radio Club	337- AB- 9-	2364
W2QW/2	Raritan Valley Radio Club	540- AB-16-	4566	W4RKM/4	Macon Amateur Radio Club	386- B-20-	2316
W5MUZ/5	Ouachita Valley Amateur Radio Club	481- A-18-	4554	W6SF/6	Stockton Amateur Radio Club	359- B-29-	2304
W8MRM/8	Motor City Radio Club	556- AB-25-	4539	W6ZUM/6	(nonclub group)	356- B- 8-	2286
W7HZ/7	Valley Amateur Radio Club	471- A-17-	4464	W1AQ/1	Associated Radio Amateurs of Southern New England	252- A- 6-	2268
W18KT/1	Narragansett Assn. of Amateur Radio Operators	618- AB-25-	4461	W4GNF/4	Greensboro Radio Club	378- B-25-	2268
W4CN/4	Amateur Radio Transmitting Society	459- A-35-	4374	W3RV/3	Andrews Electronics Assn.	350- B-10-	2250
W6YK/6	Ventura County Amateur Radio Club	538- AB-12-	4344	W0RVG/0	Heart of America Radio Club	370- B-12-	2220
W9AB/9	Michigan Amateur Radio Club	508- AB-17-	4242	W1WHF/1	Hamden Amateur Radio Club	325- AB-20-	2163
W0ERG/0	Sioux City Amateur Radio Club	465- AB-25-	4152	W3VV/3	McKean County Radio Club	359- B-15-	2154
W2CPN/2	Lockport Amateur Radio Assn.	477- AB-28-	4056	W4PLB/4	Orlando Amateur Radio Club	358- B-21-	2148
W4SKH/4	Oak Ridge Radio Operators' Club	540- AB-50-	3942	W5GWA/5	Northwest Arkansas Amateur Radio Club	358- B-10-	2148
W6HJK/6	(nonclub group)	488- AB- 4-	3796	W0QFH/9	(nonclub group)	212- A- 3-	2133
W8HZA/8	Tri-City Amateur Radio Club	594- B-20-	3714	W61NZ/6	(nonclub group)	235- A- 9-	2115
W2PPY/2	Radio Assn. of Western New York	583- B-60-	3648	W7AIA/7	Clark County Amateur Radio Club	451- AC-40-	2103
W5ZDN/5	Central Texas Amateur Radio Club	519- AB-27-	3639	W6IQD/6	Ream Field Amateur Radio Club	325- B-12-	2010
W2GLQ/2	Nutley Amateur Radio Assn.	379- A- 8-	3636	W1VPR/1	Hingham Amateur Radio Club	195- A-14-	1980
W2OR/2	Pompton Valley Radio Club	378- A-20-	3627	W5PDO/5	Los Alamos Radio Club	245- AB-10-	1929
VE1FO/1	Halifax Amateur Radio Club	329- A-14-	3321				
W5MPZ/5	Sandita Base Radio Club	391- AB-15-	3309				
W4PAY/4	Amateur Radio Club of Falls Church	380- AB-15-	3243				
W6HTR/6	North Bay Amateur Radio Assn.	434- AB-12-	3243				

Halifax Amateur Radio Club, 3321 points in Class 3A with the club-assigned call VE1FO/1, posed with this display of equipment while breaking camp at Glen Margaret, N. S. Sitting (l. to r.): VE1LY, VE1FO, musician VE1SL, VE1SF, VE1EK. Standing: VE1RR, ex-VE3EA, VE1OM, VE1WL, VE1DB, VE1WD, VE1HJ, VE1ED.

(Photo by VE1LZ)





In the 20' phone tent logger W9PBJ puffs away as W9DDP consummates a FD exchange for Chicago Suburban Radio Assn. Note the headset that sports both mike and headphone, leaves hands free for switch-throwing and receiver-tuning. Under the call W9SW/9, CSRA wound up with 3933 points in Class 6A.

W2HFA/2	Center Radio Club	226	AB-7	1926
W6SFT/6	San Francisco Naval Shipyard Amateur Radio Club	265	AB-6	1923
W9TRG/9	Manorland Club	315	B-17	1890
W2RQ/2	Par-Troy Amateur Radio Assn.	287	AB-7	1887
W0HP/0	Lincoln Amateur Radio Club	313	B-20	1878
W6MWO/6	Los Angeles Young Ladies Radio Club	253	AB-6	1866
W5TEH/5	Webster Parish Amateur Radio Club	281	B-20	1836
W6QV/6	Eagle Rock Teen Age Radio Club	202	A-10	1818
K9WAQ/0	Wichita Amateur Radio Club	301	B-15	1806
W4NSM/4	Central Virginia Amateur Radio Club	300	B-10	1800
W8RUM/8	Greater Cincinnati Amateur Radio Assn.	307	ABC-10	1788
W2QME/2	Woodbridge Radio Club	244	AB-10	1767
W9WLZ/9	Green Bay Mike and Key Club	259	AB-22	1734
W0FKM/0	Tri-State Radio Society	287	B-18	1722
W1IWV/1	New London Civil Defense	286	B-8	1716
W8SP/8	Mountaineer Amateur Radio Assn.	189	A-15	1701
K2HLL/2	Peekskill Communications Club	256	AB-25	1698
W1TRB/1	(nonclub group)	160	A-3	1665
V1E3BAC/3	Mohawk Amateur Radio Society	160	A-11	1665
W9AYR/9	North Eastern Wisconsin V.H.F. Radio Club	203	AB-3	1659
W5CKN/5	Gulf Coast Amateur Radio Club	158	A-8	1647
W1SRF/1	Meriden Amateur Radio Club	295	AC-10	1551
W5BGP/5	Texas Amateur Radio Club	216	AB-9	1542
W1ZLH/1	Middlebury Mike and Key Club	255	B-6	1530
W0RUJ/0	Southeast Nebraska Radio Club	210	AB-12	1530
KP4ID/KP4	Puerto Rico Amateur Radio Club	225	B-14	1500
W7ETO/7	Apple City Radio Club	215	B-10	1440
W4LEN/4	Decatur Amateur Radio Club	204	B-20	1374
W5QDK/5	Pecos Valley Amateur Radio Club	251	BC-4	1373
W8GMD/8	Morgantown Amateur Radio Club	151	A-10	1359
W2UBW/2	Mid-Island Radio Club	150	A-10	1350
W5MFB/V1E3	(nonclub group)	224	B-9	1344
W6IFZ/6	Richmond Amateur Radio Club	223	B-	1338
K2HUN/2	Southern Counties Amateur Radio Assn.	197	B-12	1332
W4NEP/4	Atlantia Radio Club	221	B-10	1326
W8CMA/8	Paducah Amateur Radio Club	114	A-6	1251
W4VHU/4	Allegheny Area Amateur Radio Club	204	B-6	1224
W7SRB/7	Middleboro Amateur Radio Club	136	A-7	1224
W8TYL/0	Bainbridge Island Amateur Radio Club	198	B-6	1188
W9MJL/9	Scott County Amateur Radio Club	108	B-7	1158
W4AIR/4	Vermilion County Amateur Radio Club	131	AB-6	1145
W4TLA/4	Aiken Amateur Radio Club	189	B-7	1134
	Coastal Plain Amateur Radio Club			

W9PSD/8	Richmond Amateur Radio Assn.	125	A-10	1125
W2BRK/2	Astoria Radio Club	106	A-8	964
W4NEK/4	Naval Air Station Radio Club	305	C-15	915
W2RCX/2	Batavia Amateur Radio Assn.	99	A-14	891
W8AM/8	Coffee Drinkers of Detroit	73	A-9	882
W8HLD/8	Catalpa Amateur Radio Society, Cranbrook Radio Club	142	B-13	852
VO2L/2	Newfoundland Radio Club	93	AB-13	828
W5SRG/5	Riverside Radio Amateur Club	137	B-12	822
W8KTV/8	Cherryland Radio Club	268	C-8	804
W8ZHO/8	Muskegon Area Amateur Radio Council	87	A-8	783
W2DYM/2	U.H.F. Club of Jamaica	84	AC-3	732
W0JUL/0	Denver Radio Club	117	B-17	702
W3PWV/3	Carroll County Radio Club	108	AB-8	699
W8ZZ/8	Detroit Amateur Radio Assn.	90	AB-15	690
W1VPT/1	Arlington Amateur Radio Club	191	A-10	684
W4CMA/4	Cedar Valley Amateur Radio Club	47	A-7	648
W0ELJ/0	Grand Island Amateur Radio Society	75	AB-15	615
W9WFF/9	Midway Radio Club	71	A-8	639
W3FWZ/3	Philadelphia High Frequency Radio Club	60	A-4	540
W1YFA/1	Walpole Amateur Radio Club	73	AB-9	489
W1KVI/1	Portland Amateur Wireless Assn.	137	AB-13	486
W8KEA/8	Midland Radio Club	60	B-15	360
W9BOM/9	Kenosha Radio Communications Society	105	C-11	315
W9MTV/9	Anderson Radio Club	45	B-11	270
W9TCE/9	Pontiac Radio Club	132	B-16	264
W2BMW/3	Tu-Baro Radio Club	95	AB-	211
W8VTD/8	Warren Amateur Radio Assn.	22	A-12	198
W0TKN/0	North Iowa Amateur Radio Club	7	AB-5	45
W9ECP/9	Whiteside V.H.F. Radio Net	5	AB-3	36

Four Transmitters Operated Simultaneously

W3PKV/3	Northeast Radio Club	1353	A-	12,177
W6PD/6	Foothill Mobile Net	1425	AB-30	9576
W6MBA/6	(nonclub group)	991	A-5	9144
K2AA/2	South Jersey Radio Assn.	972	A-45	9099
W1OMI/1	El-Ray Amateur Radio Club	827	A-20	7668
W2GTD/2	Ridgewood Amateur Radio Club	763	A-20	7092
W2JT/2	Pascale Valley Radio Club	747	A-36	6948
W2DAY/2	Northern New Jersey Radio Assn.	764	A-49	6876
W3OK/3	Delaware-Lehigh Amateur Radio Club	642	A-25	6003
W7AW/7	West Seattle Amateur Radio Club	582	A-20	5499
W6ZUU/6	Citrus Belt Amateur Radio Club	573	A-20	5382
W0CET/0	Kaw Valley Radio Club	855	B-35	5304
W6OFT/6	Palomar Radio Club	503	A-30	4545
W3PSG/3	Baltimore Amateur Radio Club	535	AB-30	4467
W6MHM/6	Hell Gardens Amateur Radio Assn.	462	A-11	4383
W2ZQ/2	Delaware Valley Radio Assn.	600	AB-20	4356
W4TRC/4	Kingsport Amateur Radio Club	684	AB-18	4324
W4IDU/4	Jacksonville Amateur Radio Society	555	AB-18	4296
W3SIR/3	Amateur Transmitters Assn.	473	AB-28	4038
W7BB/7	Lake Washington Amateur Radio Club	462	AB-7	4017
W5NW/5	(nonclub group)	633	B-14	3948
W10SA/1	Pittsfield Radio Club	501	AB-	3915
W4CUE/4	Birmingham Amateur Radio Club	636	B-20	3816
W5KC/5	Baton Rouge Radio Amateur Club	605	AB-19	3804
W8AW/8	Edison Radio Amateurs' Assn.	417	AB-13	3756
W9TCH/9	Rock River Radio Club	409	A-	3681
W5LHZ/5	Central Louisiana Amateur Radio Club	383	A-25	3672
K2EN/2	Yonkers Amateur Radio Club	552	AB-25	3660
W4MOE/4	Asheville Amateur Radio Club	502	AB-15	3615
W3GUR/3	Pottstown Amateur Radio Assn.	443	AB-9	3536
W7AH/7	Radio Club of Arizona	503	AB-	3408
W4WNZ/4	Tidewater Mobile Amateur Radio Club	405	AB-14	3375
W9OFR/9	Joliet Amateur Radio Society	327	A-18	3168
W6FOP/6	San Diego Amateur Radio Club	411	ABC-19	3045
W2GLO/2	Levittown Amateur Radio Club	311	A-35	3024
W3SJK/3	(nonclub group)	479	B-12	3024

(Continued on page 134)

The Novice Round-up

January 8th Through 23rd

ROUND-UP PERIOD

Starts	Ends
Jan. 8th	Jan. 23rd
6:00 P.M.	9:00 P.M.
Local Time	Local Time

THE invitation is out to all amateurs to plan participation in the January Novice Round-up, the beginning-of-the-year event tailored to the new operator. CQ NR! Novice or not, your presence is requested January 8th-23rd.

Novices may contact any stations and claim credit if full information is exchanged. Non-Novices will be out to make Novice contacts only. Don't hesitate giving the Novice your number and section even though you're not actively engaged in the Round-up. A few minutes of your time will help him in the competition.

A total of 40 hours is available for operation. Times used listening for calls, checking bands for WN stations, etc. are included in this 40-hour total. (Note the sample reporting form shown.)

Your final score is computed by adding the total number of contacts to the speed certified on your Code-Proficiency Award or endorsement sticker; this new sum is then multiplied by the number of different ARRL sections (see page 6) worked to obtain your claimed score. (No Code-Proficiency certification? See contest Rule 4 and Operating News this issue of QST—there's still time to qualify and gain the extra points!)

Novice entrants would do well to check the frequencies above and below the 3700-3750-ke. region for contacts with non-Novices. While the 100-200 watt stations can operate in the Novice segment without undue QRM to general operation, the higher-powered fellows will probably follow the past practice of calling WNs while outside the Novice band limits.

How To Take Part

Listening to a contest exchange by any of the top contest operators would indicate a pattern to guide you toward efficient activity. If KN6GTK (San Joaquin Valley Section) called CQ and was answered by WN1CKZ of Connecticut, their

exchange would be an example of contest operating "know-how" if it approximated this form:

CQ NR CQ NR CQ NR DE KN6GTK
KN6GTK KN6GTK K

KN6GTK KN6GTK KN6GTK DE WN1CKZ
WN1CKZ WN1CKZ AR

WN1CKZ DE KN6GTK R HR NR 10 SJV
BK

BK R HR NR 6 CONN BK

BK R TNX 73 SK WN1CKZ DE KN6GTK
Short? Yes! It should be both brief and brisk

during a contest event. All information has been exchanged and acknowledged (by use of "R") and there has been no unnecessary repetition. Send the required information (number and section) keyed to your receiving ability; avoid repeating unless you're requested to do so and in short order you'll be in proper form for the '55 Sweepstakes!

To help minimize your paper work, convenient log sheets are available without charge from ARRL. Write today for these summary sheets and a poster-style U. S. map for your shack.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this QST.

(Continued on page 144)

Sample of reporting form that must be used by all contestants.

STATION KN6GTK — SUMMARY OF CONTACTS NOVICE ROUND-UP

Band	Time on or off air	Date, Time of Contact	M _y NR Sent	M _y Section	His NR Recd	His Call	His Section	Number of each new Section as worked
80	1801	Jan. 8 1807	1	S.J.V.	1	K6BPL	San Diego	1
		1820	2	"	1	K6CQT	S.J.V.	2
		1902 1850	3	"	2	W7WKL	Mont.	3
		1915 1920	4	"	10	W9BRD	Ill.	4
40		1930	5	"	4	W9YXM	Ill.	5
		2020 2005	6	"	5	W1ZID	Conn.	6
15	1200	Jan. 9 1215	7	"	7	WN5FJS	S. Tex.	7
		1232	8	"	5	WN5FJM	S. Tex.	8
		1240	9	"	9	W1YNC	Conn.	9
		1258	10	"	6	WN1CKZ	Conn.	10
		1325 1312	11	"	16	K2EIU	E.N.Y.	11
								16

Total operating time: 3 hours 31 min.
Bands used: 80, 40 and 15

No. contacts: 11
CP credit: 15
No. sections: 7

Claimed score: 11 contacts plus 15 CP = 26×7 (sections) = 182

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is true and correct to the best of my knowledge.

Signature: _____
Address: _____

Happenings of the Month

RENEWAL FORM 405-A

FCC's amateur licensing unit continues to have occasional difficulty with improper or incomplete filling-out by amateurs of the "streamlined" renewal form 405-A. Let's go over the ground once again:

The regs say that renewal of an amateur license may be filed any time within the 120 days prior to expiration. If, during such period, you contemplate a change of address or taking the exam for a higher class of license, combine your renewal request with such an action and use the standard form 610. If, however, your application will be only for renewal, use form 405-A which you can also obtain from your district FCC office. This form consists of three joined cards, each of which must be filled out — in other words, in triplicate. Most of the questions are self-explanatory, but the various items under paragraph (4) sometimes cause confusion.

(4a) *Nature of Service.* Here insert the words "amateur operator and station," assuming you are renewing a combined license; if only one license is involved, such as a trustee-club station, so indicate.

(4b) *Class of Station:* Simply, "amateur."

(4c) *Call Sign:* Obviously, the call being renewed.

(4d) *File No.:* This is the confusing one. Leave it blank! (The question applies only to certain other services which also use this particular renewal form).

(4e) *License term ending:* This is the expiration date of your ticket being renewed; it is *not* the expiration date five years from the present.

Then you have the form notarized (only the one card segment needs this action, as indicated) and mail the whole thing to Washington, not to your district office. It is not necessary to include your present ticket. FCC will process the application and mail back to you one portion of the

form, authenticated, to serve as your renewal. Thenceforth you carry both your present ticket and your renewal "endorsement" as your license. Incidentally, don't rush to get in your renewal right at the 120-day mark. In the processing of such applications FCC doesn't get around to handling them until about 30 days before expiration anyway; so 45 or 60 days in advance of expiration date is a good time to apply.

SPECIAL ROANOKE ELECTION

To All Full Members of the ARRL Residing in the Roanoke Division:

A special election is about to be held to choose a vice-director for the 1955-1956 term, inasmuch as there was no valid nomination for this office filed in the course of the regular election now being completed.

Nomination is by petition, which must reach the Headquarters by noon of December 20, 1954. Ten or more Full Members of the Roanoke Division may join in nominating any eligible Full Member of that Division. The election procedures are specified in the By-Laws, a copy of which will be mailed to any member upon request. Or refer to the August and September *QST* election notices for general information. Full Members are urged to take the initiative and file nomination petitions immediately.

For the Executive Committee:

A. L. BUDLONG
Secretary

October 1, 1954

SIDEBAND SEGREGATION DENIED

Something over a year ago the Old Old Timers Club petitioned FCC to remove single-sideband operations from regular amateur voice subbands, claiming the two modes were incompatible. The request had the support of a number of individual southern California amateurs, whose argument



There are now 35 licensed amateurs among the crew at ARRL Hq., well over half the total staff personnel, with the addition in October of six new Novices shown here previewing a "bread-pan" wavemeter just completed for an up-coming issue of *QST*: Lorraine Brouillette, WN1CJM, secretary to the Treasurer; Gerald Pinard, WN1CII, shipping department; Mrs. Muriel Roche, WN1CJL, mail room; Connie Hegarty, WN1CIE, advertising department; Sam Cowles, WN1CKZ, traffic manager; Joan Mulligan, WN1CIC, circulation department. ACM-Phone Ellen White, W1YYM, continues her noon-hour tutelage of these newcomers, now of course aiming for higher grades of license.

was that segregation was needed for proper advancement of the art. The Commission has now dismissed the petition, without any affirmative action, reporting that there is no evidence to show incompatibility, and stating further that it is contrary to policy to allocate additional subbands for special groups of amateurs and modes of emission.

CALL SIGN REQUESTS DENIED

Some amateurs recently have requested that FCC make some additional exceptions to its present hard-and-fast rules about the orderly issuance of call signs, to provide two-letter calls for holders of the old "Certificate of Skill" issued by the Department of Commerce, and to provide distinctive call signs to Extra Class licensees. The Commission has denied the requests, pointing out that the burden of processing such special requests would only have the effect of slowing down the entire amateur licensing operation.

GENERAL CLASS EXAM SCOPE EXPANDED

While for some years the old Class B and Class A written examinations remained pretty much the same in scope and, indeed, in precise questions, in recent years FCC has been following a policy of periodic revisions of the technical and regulatory material covered in the various written tests. Some time ago a few questions were added to the Novice exam. When the "restricted" phone bands were thrown open to General and Conditional Class amateurs, FCC upgraded the written exam for those classes to include more material on radiotelephone subjects. By the end of this year written examination papers for the General Class (and of course for Conditional and Technician Classes, since they are the same exam) will carry a number of additional questions on various technical subjects. The *License Manual* now being distributed from Hq. has complete data. For the information of those for whom the exam might be imminent, we publish herewith example questions to show the scope of the new material.

What is the reciprocal of resistance?

What is skin "effect"?

How may the shock hazard from high-voltage condensers, after the power supply is turned off, be reduced?

What precautions should be taken to avoid the danger of shock from high-voltage electrical circuits?

What are the undesirable effects of overmodulation in radiotelephony?

What effect does the Q of a circuit have on harmonic output?

What are the relative bandwidths of Type A1 and A3 emissions? Of single-sideband and double-sideband amplitude-modulated emissions?

What is the advantage of a high-pass filter at the input circuit of a television receiver?

In the event of harmonic interference to television reception, what is the advantage of a low-pass filter in the output circuit of an amateur transmitter?

What is the Q of a resonant circuit?

(Continued on page 144)

Walter E. Bradley

1910—1954

Walter E. Bradley, W1FWH, for nearly thirteen years an ARRL Hq. staff member conducting the Technical Information Service passed away in Hartford on October 30th after a short illness. He was 44.



Born in Greenwich, Conn., W1FWH joined Hq. in 1942, bringing with him considerable experience in conducting radio classes in local schools. Handling the TIS, Walt Bradley became a friendly counselor to thousands of amateurs seeking advice on suitable rigs to build, or on technical problems once they had started construction. Perhaps to many, he was the League. And because his whole heart and soul were in his work, his warm and helpful letters of guidance won many staunch supporters for the League he loved so much. Despite the daily quantity of inquiries to be answered, he was never too busy to jot down a suggested wiring diagram or other sketch when he thought it would amplify the letter.

As an extra project, Walt handled with meticulous care the annual revision of the *Handbook* tube tables, and autumn evenings would regularly find the light in his office burning through the darkness so that he might meet the copy deadline.

As civil defense radio officer for Hartford, Walt contributed immensely in developing the RACES program of that city. An active amateur, he was also secretary of the Newington Amateur Radio League, and a mobile and Field Day enthusiast. His many friends will, with those of us at Hq., feel a keen sense of loss at his passing.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

THE unique status of the YLs whose photographs appear on these pages is indicated by the habits they wear. We feel fortunate that they have graciously taken time from their busy lives as members of religious orders to tell us of their amateur radio experiences.

Here are excerpts from their letters:

WIHWH

As an Industrial Arts teacher, my work is entirely with boys. I teach woodwork and drafting in the Tyler Junior High School in Providence, Rhode Island. We have a pleasant shop which occupies the entire length of one-half of the building. Here the boys make the usual articles such as tables, cabinets, etc., and some not-so-usual articles.

All of this leads up to my introduction to amateur radio. Our foundress, Mother McAuley, wished the members of her communities to be alert to every new branch of learning and to keep up with the latest methods and developments. I happened, in my capacity as shop teacher, to meet one of the directors of the school who was an A-1 amateur. It was decided that it would be a good plan to give the boys an opportunity to see what an amateur station was and introduce them to the many opportunities that were open to them in the field of electronics. As a result, some have already chosen that field for their life work and have become amateurs.

I started to learn the code and prepare myself to take my Class B examination. In October, 1933, I went to the Customhouse in Boston and took the examination. Some years later I took the examination for Class A. So far as we have been able to find out, I was the first Sister in the world to receive an amateur license.

I have worked on the 75-, 40-, 20-, 10-, 2-meter and on the old 5-meter bands. At present I am on 75 with a Viking II. The hurricane demolished my antenna, which was attached to the cupola about 100 feet high. My shack was also flooded.

I guess I am just an ordinary ham. During the war, I was a member of the Providence Police Radio Patrol. I like to QSO both 'phone and c.w. My extracurricular engagements tend to break up my time so that I have never felt justified in joining a net, which I certainly would do otherwise. I have written a brochure on radio for *Youth Magazine*, and have had some very interesting and enjoyable contacts and have made some very fine friends.

There is nothing inconsistent in a religious being an amateur radio operator. I think the future

*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.



Sister M. Charlotte, C.S.C., W7MUT.

will see many more religious women in the field, and then we who have pioneered will be glad that we have blazed the trail for them.

Incidentally, amateur radio provides an excellent means of keeping in touch with other religious members who are toiling in the foreign mission field.

I think ham radio is one of the most enjoyable hobbies that anyone can have, be he OM or YL. But it is more than a hobby; as for the youth of today, it can be a steppingstone to a very fascinating occupation. In no organization is a better spirit of fellowship manifested than in the amateur fraternity. I am very happy to belong to it.

W7MUT

When I came to Boise ten years ago, I had never heard of amateur radio, but in the capitol city of Idaho there are more hams than in most cities of the same size. I wanted to buy some war surplus material for my physics laboratory (St. Teresa's Academy—Ed.), and that is how I came into the field. I told my Superior that I could not use a transmitter without an amateur license, so she told me to get one. In July, 1948, I called W7IWU on the telephone and asked him to help me get a license.

In August he gave the exam, and in October I was on the air. A year later I passed the Class A and B exams.

Since that time I have worked most of the bands, but I like 10 meters best when it is open and, in the meantime, I use forty mostly. I used c.w. almost exclusively at first, but now I use 'phone, too. I have belonged to MARS for three years and was net control one summer. Occasionally, I check into the YL net on 20 meters and am able to give a number of Idaho contacts. I also belong to the Buzzards, Dog Catchers and Polecat Nets and have WAS and RCC certificates.

I think building would be my favorite phase of amateur radio, if I had more time. As a religious and as a full-time science teacher, my time is very limited.

My rig is really something to look at now, as some friends among the Buzzards of California built me a beautiful final, with 211s as modulators. I use Command transmitters to drive the 211s and now have 300 watts on the air. My antenna on all bands is a Zepp, about 136 feet long, and for ten





Mother L. Lawrence, R.S.C.J., W9CLE, and students.



Sister M. Emiliana, R.S.M., WIHUI.

I have a three-element beam on top of the school. How I long for the ten-meter band to come back as it was when I first was on the air, and got my first big thrill when I heard Massachusetts giving me a call.

My ticket gave me a greater thrill than any accomplishment, and the joy of it has never faded. The amateurs I meet on the air make me know that the world is still a joyous place, and that it is a safer place because of the amateurs!

W9CLE

In 1948 or 1949, Mother Reilly, president of Barat College [Lake Forest, Ill. — Ed.] asked Don Hunnicutt, W9GAP, for advice in buying a receiver to enable us to listen to Vatican broadcasts. Mr. Hunnicutt, chief engineer of our broadcast studio (we have a wire direct to WKRS in Waukegan, Ill.) suggested a popular make. I don't know if any Vatican programs were heard, but in October, 1950, when I returned from studying at the Catholic University, the main interest was Mr. Hunnicutt's 500-watt transmitter. I was merely amused by the transmissions that were appearing on our public address system and all the telephones. It was the first portable he had built and I used to watch him tinker with it, never dreaming that someday I would be an operator myself. Mother Reilly wanted to set up a short-wave radio club for the students as soon as she found out how simple the procedure was. She set the example by using the code equipment she had procured, but the necessary time to devote to study was often lacking. After Mr. Hunnicutt moved to Champaign, Ill., the next step was to accept the proffered services of Chief Frank B. Ramme, USN, W9BWR, who is not only an ardent ham but also a fine teacher with equipment for group instruction. We organized the club at last in September, 1953, enrolling fourteen students. Mother Reilly and I took our Novice examinations early in December and by the end of the month, when the tickets came, we had our Viking II installed, complete with VFO, signal sentry, Matchbox antenna coupler, s.w.r. bridge, and — most important — TVI suppression. The antennas are an end-fed Zepp for 80 meters and a beam for 20. I hope to set up another for 40 and then perhaps for 10. We studied hard to take the examination for the General license during the Easter vacation, and as soon as the tickets came I was named trustee for the club and sent in an application for a license. The ticket came during the graduation ceremonies. A little late for me to capitalize on it for arousing more enthusiasm among the departed students, it was nevertheless ap-

preciated. The call letters are W9HEH. Mother Reilly was transferred to Seattle in early June, where she has already interested several youngsters in her hobby. Her call is W9CLW. I do not know whether she has made application for a W7 call or not. She will not be able to set up a station where she is, so I fear she is lost to the ranks of active amateurs, but her interest is still in it. Chief Ramme is now on duty in the Pacific. He left with us an 80-meter station for the Novices to use: an Eldico TR-75-TVI transmitter, a Hallicrafters SX-28, and a center-fed half-wave antenna. We also have a two-meter Motorola rig on a fixed frequency.

I would be attracted to building if time were cheap. Communications will have to be our main concern. We have students from many foreign countries, and we are hoping to contact friends and families of theirs who have stations. We are also interested in civil defense, and hope to contribute some small share in the programs being worked out.

There is one lesson we are all learning from our hobby — that amateurs are a friendly group with genuine interest and ready service for other amateurs. This summer I taught three Dominican nuns and on the side found it easy to persuade them to start learning the code. It is so easy to arouse interest in amateur radio, and for anyone dealing with youth in extracurricular activities, it is an asset.

Little can be added to the stories given above — they certainly reemphasize the appeal of amateur radio to people in all walks of life.

— — —

The November 20th issue of the *Saturday Evening Post* features an article by Murray Hoyt entitled "Lovely Neighbor." Inspiration for the fiction piece with an amateur theme came from sixteen-year-old Judy Gage, W1YCU, of Worcester, Mass. (Judy's photograph appeared in the June column.)

Advance Notice!

The first International Convention of the Young Ladies Radio League will be held the week end of June 25, 1955, at the Hotel Miramar in Santa Monica, California. The Los Angeles Young Ladies Radio Club will be the hostess club. All YLs, whether YLRL members or not, are cordially invited to attend.

40-Meter 'Phone Net

The forty-meter 'phone net was omitted from the schedule of nets listed with the YLRL which appeared in the October issue. All YLs who operate on forty are invited to call in on 7215 kc. Thursdays at 1000 EST. W4SGD is NCS, with W8HWX as alternate.

YLs You May Have Worked

A quick biography of one of the most well-known YLs of the Southwest.

She's Yelive Matthias, W5DRA, of Las Cruces, New Mexico. Her initial interest in radio sprang from a high-school physics class. Later, a course at a technical school



"Teev" Matthias, W5DRA.

prepared her for an amateur license in 1933. Her first rig was a jumble of home-built parts fastened to an old ironing board, in lieu of the usual breadboard, which held out for 38 contacts on 80 c.w. before the hand-wound transformer smoked. Out for a ride one evening, Teev spotted the call letters W5CFX on the tire cover of a Model A chugging along ahead. A few c.w. toots on the auto horn and both drivers stopped for a personal QSO. Result: the happy marriage of the two in 1936. Since then, Dick (now W5BIW) and Teev have enjoyed amateur radio together in a variety of ways. In May 1953, they took over the editing and publishing of the monthly State Radio News Bulletin *CQ New Mexico*, which was started in 1948 by W5NKE and his XYL W5RMH. Teev is publicity manager of the Mesilla Valley Radio Club. She operates on 10, 20, and 80, as A5DRA she participates regularly in the State YL MARS net.

Keeping Up with the Girls

Captain Kurt Carlsen's (W2ZXN) two young daughters are now KN2s ITV and JAT. WN1CDE is the call of twelve-year-old Marsha McCoy, daughter of OM W1ICP of Headquarters, Southwestern Division Director W6KW's XYL. Roxanna, has been licensed for several months as KN6ELO — thanks to W1YYM, Ellen, for the foregoing. . . . Not only have several of the young YLs featured in the June column gone on to General Class licenses of their own, but two, at least, have talked their fathers into licenses. K2DSL's dad is now KN2JID, and Mercedes is coaxing Mom, too. W1YCU's dad recently came through with WN1BEN. . . . On Sept. 24th W1UBM, Norma, became the bride of W1YOC, Walt (see Sept. '52 YL column for picture of Norma). . . . Three additional YLRL appointments: District chairman for Africa: Joy Jones, ZS6MW, P.O. Box 400, Pretoria, Transvaal, So. Africa. District chairman of England and Europe: Louise (ten) Herkel, PA0ZC, 163 Wassenaarsweg, The Hague, Holland. District chairman for Australia and New Zealand: ZL4GR, Myrtle Earland, 69 Albany Street, Dunedin, N.I. . . . W0LGG, Bertha, of Marshalltown, Iowa, is sending code practice on 80 six days a week. . . . After three years in Puerto Rico, KP4WI, Millie, plans to return to the U. S. in January. . . . When VE3DDA visited VE3AJR, Dell, recently, Eleanor stayed up so late working c.w. that she used Brylcreem instead of toothpaste on her toothbrush the next morning! . . . OM W1KTU, operating maritime-

mobile aboard the SS *African Endeavor*, reported fine contacts with ZS2JR, Helie; ZS2KZ, Eileen; ZS6AIQ, Theda; ZS7F, Paddy; and ZS8B, Mary. . . . The Los Angeles YLRC sent a delegation from its two-meter net to hear W1HDQ speak during the V.I.F.E. Editor's recent West Coast trip. . . . W1VBT, Cecile, announces the birth of her fourth jr. op. Marie, on Sept. 17th. . . . At one time last summer VE6MP, Maude, had nine hams with their families as her guests at her new mountain-side home in Calgary, Alberta. . . . Several new members have been welcomed to the L.A. YLRC: W6WQK, K6ELI, KN6DPX, ELO, EXQ, EXV, GSU and IFF. . . . Culminating a courtship which began on 75 meters, on June 27th W6QYL, Martha Phillips, became the bride of W6RDQ, Noel Edwards. Martha, a L.A. YLRC member, was introduced to Noel via the Club's Southland Net by W6JZA, Elsa. Unfortunately, Martha became ill shortly after her marriage, and she will be confined to bed for some time. Her address is Cabin 90, Box A, Monrovia, California. . . . On Oct. 7th, W6UHA, Maxine, had a luncheon for visiting W5RZJ, Louisa. Other YLs present were W6s CEE, EHA, KYZ, LBO, MFP, QOG and WRT; and on Oct. 8th, W6NAZ, Lenore, interviewed W5RZJ on her TV program. . . . Two new YLs in Glendale are KN6CMK, Alice, and W6DXI, Gladys. . . . The Long Island Unit of the YLRL voted to continue its work for the *Braille Technical Press*. . . . YLs who attended the New England Division Convention at Manchester were W1s BCU, BFC, FTJ, MCW, MVX, OAK, QJX, RLG, RYJ, SVN, TRE, UKR, UQA, VEP, VVS, VVT, VYH, YPG, YPH, YWT, YYM, ZEL, ZID, W2s BTB, KYE, K2IWO, and VE2HL, W1VOS, Marge, YLRL chairman for New England, conducted the YLRL meeting. W1YPI, Leona, took the top prize, an SX88.

YL Expedition

Hail the fair sex! Indefatigable W9GME, Grace Ryden of Chicago (see this department, May, 1953), could well be the instigator of a new type of YL exploit — amateur radio expeditions "manned" exclusively by YLs!

On August 19th Grace journeyed by boat to Madeline Island, one of the twelve Apostle Islands in Chequamegon



W9GME/9 on Madeline Island.

Bay off the coast of northern Wisconsin. Discovered in 1665, the island still is inhabited almost exclusively by Chippewa Indians, rare birds, deer, and big uncorralled bear. After five hours of search for a good antenna sight, Grace found the spot, and while she hoisted a half-wave doublet, two Chippewas stalked through the bush and eyed the curious proceedings. Using a portable transmitter running 30 watts and a Command receiver loaned to her by W9CAJ, Grace contacted W9BCY in Ashland, Wisconsin, on ten 'phone, and originated three messages — one each to W1BUD, W9AND and W9YIX. Her Indian friends stood by, duly flabbergasted by the invisible voice blasting forth from the speaker. At dusk, thought of 1300-pound bear goaded Grace to depart sooner than she would have preferred. She's already planning future trips to each of the twelve Apostle Islands, with Otter Island next on her list. The State of Wisconsin will place a plaque on the site shown in the picture, commemorating Grace's activities.

Inspired yet, girls? Think of the possibilities!

• On the TVI Front

21-MC. TVI

Good winter band openings bring about an increase in 15-meter operation. This often brings to light the presence of neighborhood TV receivers with 21-Mc. i.f. strips. If such is your interference problem, you might note the continued availability of the Kiser article "TV I.F. Interference." Reprints of this article, discussing the amateur operator, the doctor's dilemma, technician's role, manufacturer's duty, etc., are available from ARRL upon request. The *QST* TVI bibliography continues to be available, too, as are numerous other printed items tailored to your TVI troubles. Address all requests to the Communications Department.

ARRL TVI DEMONSTRATION VISITS DALLAS

It isn't every day that over 500 TV servicemen gather under one roof at the same time; however, such was the case during the Second Annual Radio and Television Service Clinic and Electronics Fair held in Dallas, Texas, on August 27th-29th. Officials of the Fair invited ARRL to present its now-famous TVI demonstration in order to instruct visiting servicemen on the causes and cures of TVI. The League was happy to accept the invitation, of course, and the show was presented at the Fair under the direction of Lewis G. McCoy, W1COP, of the ARRL technical department staff.

As a result of numerous planned tours, the ARRL TVI demonstration has been witnessed by thousands of TV servicemen and amateurs in over 50 cities throughout the nation.

ENCOURAGING LETTER

Editor, *QST*:

I have just finished reading that Vermont will have a television station shortly. As one of the thousands who has gone through the same period and successfully weathered it, I would like to address an open letter to those WIs affected.

This does not mean the end of ham radio for you — not even on 10-meter 'phone! You don't have to give in to it, and you can live with your neighbors. Your hobby can aid thousands in a period of distress. Your hobby is an instrument of peace, helpfulness, and communication. . . .

But it does mean the end of some things: sloppily-constructed rigs, 3 turns on the antenna link, mismatches. But these things never aided you anyway, did they? And in the long run you will own a better, more efficient transmitter. . . .

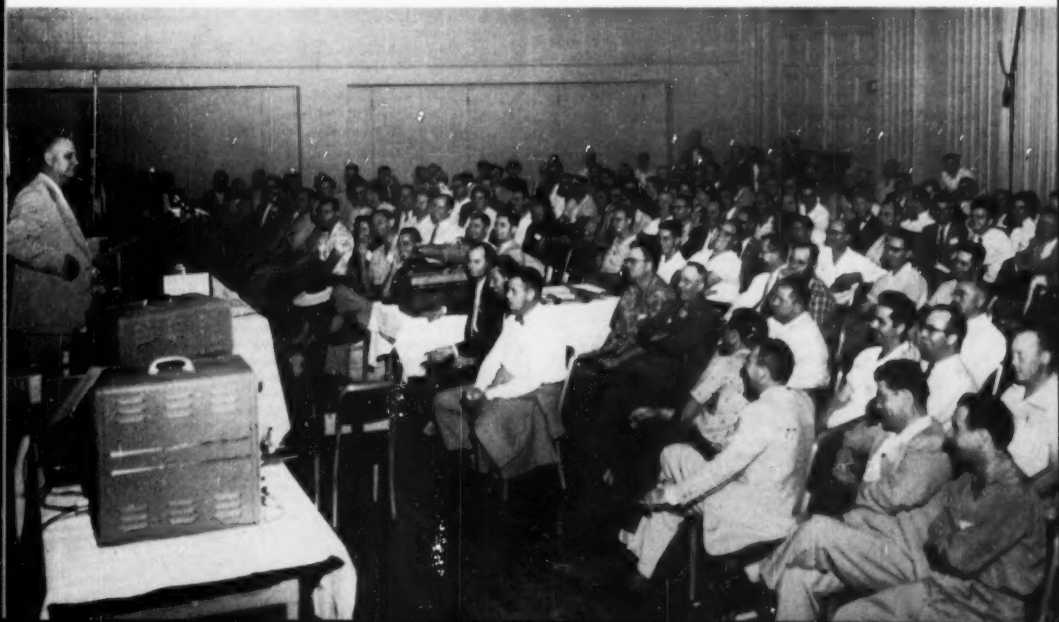
And since there may always be so horrible a television set that it could never reject TVI, why worry about any complaints that may result in your receiving a notice from the FCC? . . . The viewer is instructed to solicit *your* cooperation, too! Try to cooperate. . . . Did you ever realize that when you reply to these complaints you are going on record as having a clean rig? The instant you clean up your rig so your *own* TV set utters no complaint, that's it. Nothing more is required. By staying off the air you do nothing in the right and much in the wrong. . . .

Phil Rand has spelled it out for you. Using his techniques, I have been able to operate a TBS-50-D on 10 'phone with the family TV, just ten feet away, tuned to Channel 2. . . .

So please, *please* do not stay off the air.

—Charles F. Smith, jr., W3UJP

Partial view of the audience at the Dallas TV Servicemen's Clinic and Fair



I.A.R.U. News

CALENDAR NOTES

The December Calendar has been prepared and will be in the hands of member-societies shortly. Among subjects discussed are the announcement of the readmission of the *Japan Amateur Radio League* as the member-society for Japan; acceptance of the proposal made by the *Radio Society of Great Britain* recommending the adoption of the RSM Code; and a proposal by Headquarters that the *Radio Club Boliviano* be accepted as the member-society for Bolivia. Mention is made of further implementation of the Atlantic City allocations in Hong Kong, due to effective liaison between the Postoffice and the *Hong Kong Amateur Radio Transmitting Society*. The following members have completed, this year, their 25th year as members of the IARU: *New Zealand Association of Radio Transmitters*, *Norsk Radio Relae Liga*, *Experimenterende Danske Radio-amatorer*, *Sveriges Sandreamatorer*, *Union Schweiz Kurzwellen Amateure*, and *Irish Radio Transmitters Society*. Another 25th anniversary: that of the *Calendar* itself!

A fine international convention was held by the *Savez Radioamatera Jugoslavije* in Ljubljana August 19th-23rd. Over 500 hams, from England, Sweden, Denmark, Austria, Italy, Germany and Yugoslavia, were present.

Also in the *Calendar* is the annual report of the Secretary, which reflected a fairly quiet year, with no major conferences. It showed moderate progress in the liberalization of operating restrictions in several countries; notably, Austria withdrew its objections to international communication by its amateurs, and DX restrictions in the Philippines were eased. Several new countries were put on the DX map by expeditions.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as

listed below. (**Bold-face** type indicates a recent change from previous listings.) Do not send foreign cards to A.R.R.L. headquarters except those for which no bureau is here listed.

For service on incoming foreign cards, see list of domestic bureaus in most QSTs (page 56 of September) under the heading, "A.R.R.L. QSL Bureau."

Algeria: Via France
Angola: L.A.R.A., P.O. Box 152, Luanda
Argentina: R.C.A., Avenida Libertador General San Martin 1850, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: DVSV, Kierlingerstrasse 10, Klosterneuberg
Austria: QSL Bureau (U. S. Occupation Forces), APO 168, % Postmaster, New York, N. Y.
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: VP6PX, Wood Goddard, Bromley, Welches, Christ Ch., Barbados, British West Indies
Belgian Congo: P.O. Box 271, Leopoldville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: VP9D, James A. Mann, The Cut, St. Georges
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: Desmond Yong, 22 Sussex St., Charlestown, Georgetown #16
British Honduras: D. Hunter, Box 178, Belize
Bulgaria: Box 830, Sofia
Burma: B.A.R.S., P.O. Box 376, Rangoon
Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06-50000, Canton Island, South Pacific.
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Box 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: Radio Club de Costa Rica, P.O. Box 535, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Lealtad No. 660, Havana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague I.
Denmark: P. Heinemann, OZ4H, Vanlose Alle 100, Copenhagen
Dominica: Calle Duarte #76, C. Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
Eire: I.R.T.S. QSL Bureau, % EI5Z, 23 Orwell Gardens, Rathgar, Dublin
Fiji: S. H. Mayne, VR2AS, Victoria Parade, Suva
Finland: SRAL, Box 306, Helsinki

(Continued on page 148)



Dr. Edmundo A. Reyes, DU1OR, president of the Philippine Amateur Radio Association (second from left) learns the history of the Wouff Hong from WIBUD during a visit to Headquarters on August 10th. Looking on are WIBDI and WIDF.

QST for



Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

PROTECTIVE CIRCUIT

4420 Narragansett Ave.
San Diego 7, Calif.

Editor, *QST*:

I read with interest the article "A Protective Circuit for Transmitting Tetrodes" in October *QST*. The circuit described there is almost identical to the circuit that was published in *QST* for April, 1948, in the H & K section. The principal difference is that in my circuit the tube was protected against failure of the plate supply in case the screen is furnished from a separate supply.

This circuit is protected by U. S. Patent No. 2,572,832; however, I have no objection to the use of the circuit by an individual amateur for his own transmitter.

— W. B. Bernard, K6EUS

OPEN LETTER

Route No. 5 (Lafayette Pike)
Clarksville, Tenn.

Editor, *QST*:

Fellow Single-Sideband Operators—please don't let the action of so few double-sideband operators cause you to become "numskulls" also. We now have an s.s.b. traffic net on 3980 kc. each Monday and Friday evening—let's all let this net grow to become a "net standard." Remember this same frequency is shared with other nets on other evenings—respect these other nets. Remembering you hold the "big stick," why use it to destroy an old-fashioned d.s.b. net just because a few carriers bother you? If one remembers that die-hards learn everything the hard way you can see that the correct approach is to set up the Interstate Sideband Net as an example of s.s.b. at its best.

The point is that the action of a very few double-sideband operators in deliberately trying (if they only knew how helpless they are) to QRM the Interstate Sideband Net is causing a few single-sideband boys (mostly power-mad Yankees, hi) to "pay-em-back" by destroying the Trans-Continental Phone Net (3975 kc.) and the Tennessee Phone Net (3980 kc.). Knowing full well, through much experience, that you can't tell a d.s.b. die-hard anything, it is felt more will be accomplished by appealing to the s.s.b. numskull. Actually, there is very little difference between the thickness of either's skull, hi. See page 9, Oct. *QST* (spark-c-w. feuds of the Twenties). Think I'll go to u.h.f. until the above "mess" clears.

— Conway L. Wilson, W4WQT

FOXY

R. R. No. 2
Hagerstown, Ind.

Editor, *QST*:

A word for the hidden-transmitter hunters from one who has had the experience of being thought of as a spy.

On October 3rd I was the "fox" for the New Castle Amateur Radio Association's transmitter hunt. The rules stated I had to be on public property. I pulled into an old barn on the premises of the Wilbur Wright birthplace and started to transmit for the "hunters." I never gave a thought about it looking suspicious as the property is open to visitors to see Wilbur Wright's birthplace and is owned by the Indiana Department of Conservation. I noticed a car come, but thought it was visitors to see the place. However, when the first ham found me he discovered that the sheriff had been called, as there was "a car in there with the motor running." Being able to hear the radio at times they thought it might be some Communists using radio.

You can see how serious this might become. Hams in general might not know how suspicious they can look at

times. In this case the deputy sheriff who investigated was a personal friend of mine so there was no trouble.

My advice would be always to get permission to use a place, even if it might not seem necessary, if you're off the road, and always make sure that any strangers around are informed as to what is happening. We as hams don't want to cause any trouble, so profit by my mistake.

— Horace N. Smith, W9PTD

THE LAST WORD

643 Oak Street
Las Animas, Colo.

Editor, *QST*:

It seems to me that every amateur who has voiced an opinion in *QST* has taken sides in the "codeless" license conflict.

It is my opinion that adequate space has been devoted to both sides and that the advocates of code have presented far the better case.

I hope we don't lose track of our main objectives, however. One of the outstanding virtues of hams is the ability to get something done as a group.

Frankly, I don't think the idea of a "codeless license" has brought about much except some differences of opinion.

If there is going to be something done, let's do it—as a group—and stop the individual debates.

— William E. Stradley, W0BHK

STAFF OPENING

We have a permanent opening for a young man to do general editorial and production work on the *QST* staff. Here is a chance to make amateur radio your career. The work requires the ability to express yourself both orally and on paper, and will later involve a modest amount of travel. Any applicant should be one with initiative and should be able to assume administrative responsibility readily.

We'd like someone about 25, preferably single, of pleasing personality, with at least a couple of years of ham experience under his belt; mostly someone who has had some publishing or writing experience. We want a young man because we would expect to train him on the job. Salary would be commensurate with ability and background.

If you are interested, write to Box A, ARRL Hq., West Hartford, Conn. State your age and marital status, and give a résumé of your educational and employment or military background; also your amateur experience.

The following list contains the call letters and countries totals of all holders of the

Postwar DX Century Club award as of October 15, 1954. The calls of new members as well as those receiving endorsement credit during the period September 15 through October 15, 1954, are included in this listing.

[illegible]

RADIOTELEPHONE

224	183	163	150	134	W0FD	DL7BA	W6KR	ZLZB	W4KY	100
W1FH	CTICL	VE3KF	W3JJ	W1GP	W0EYR	0D5AD	W6CHY	Z5ZW	W5JWM	W1CU
222	182	162	133	123	W4BF	W4AE	W4BQ	105	W5NZE	W1FX
VQ4HER	GAZU	W1ATE	H0BLA	W4BN	W4RA	W4AD	W4DMJ	W4ZV	W4PFR	W2DSU
216	181	161	149	132	W4BHB	W4KAE	W4QAD	W4W1	W4HTB	W2KSN
Z6BWB	W1MB	W1BAW	W4LDMG	W4BWA	W4TJX	CT1DX	W4EAD	W4W1	W2MA	W2OR
		W1IAMU	PT4YX	W4TJL	W4E4CM	E44Q	W4UTX	W4W1	W3AEV	
		W5MLL	Z5AFN	W4KLL	W4E4Q	E44Q	W4W1	W4W1	W3AM	
215	180	161	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
XE1AC	CE3AB	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	I1SM	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
214	179	161	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W1MVB	GBIG	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
W4HGW	GBIG	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
213	178	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W1JXX	W4ZAD	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	CM0AA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
212	177	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W1NWO	CM0AA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	CM0AA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
210	176	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W0RBI	W0RQD	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	HC2JR	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
207	175	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
SM5KP	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
204	174	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W0YND	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
203	173	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W3JNN	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
W5BGF	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
202	172	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W2APU	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
GMD10D	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
198	171	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
GZPL	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
197	170	160	149	132	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W2BKA	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
196	170	154			W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W6AM	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
195	170	154			W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W6DI	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
193	169	152	139	126	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W3BES	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
190	168	151	137	125	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W2AFQ	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
W0BF	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
E4ZQ	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
ZL1HY	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
Z54Q	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
187	164	135	124	118	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
W4CZ	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR
184	164	135	124	118	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN
CX2CQ	W4HWA	W1BET	W4W1	W4BWA	W4KAE	W4QAD	W4ZV	W4HTB	W2KSN	W2OR



The Eighth Naval District won the top three places in the first national competition among Naval Reserve electronics divisions for excellence in electronics training during fiscal year 1954.

Naval Reserve Electronics Division 8-12, Paris, Texas, came from behind to win the Hooper trophy (p. 73, November *QST*).

In third place in the Eighth Naval District competition at the end of May, a final score of 104.2531 carried NRED 8-12 to the top among approximately 125 electronics divisions. Cmdr. Paul H. Daniels, USNR, is commanding officer.

Naval Reserve Electronics Division 8-10, Tyler, Texas, commanded by Lt. D. Hudson, jr., USNR, was a close second with a score of 104.1999. Another Tyler division, Naval Reserve Electronics Division 8-14, commanded by Lt. W. J. Murdaugh, USNR, scored heavily in June to win third place with 101.7663 points.

Fourth place in the national competition went to Naval Reserve Electronics Division 12-6, Santa Rosa, Calif., commanded by Lt. Cmdr. A. R. Butz, USNR, with a score of 100.1308.

The Eighth Naval District was the first naval district to put all of its Naval Reserve training centers on the air as licensed amateur radio stations.

NFD at district headquarters in New Orleans was the first master control station with all of its stationkeepers and Naval Reserve supplement personnel holding amateur radio licenses.



How's DX?



CONDUCTED BY ROD NEWKIRK,* W9BRD

Who?

In many respects, thirteen years is a long time. W2TNC agrees. We think you'll find the following excerpt from his recent letter quite interesting.

... On the morning of December 7, 1941, at about 0700 Hawaiian time, [I was operating] K6SRZ at Fort Shafter on 14,200-ke. 'phone, working a station in the Colorado-Utah area. As you no doubt can well imagine, there came a bit of confusion around there at that particular moment. The operator of the mainland station heard some of the fracas in the background and asked us—Harry Longerich, W2GQY, and myself—what all the noise and fuss was about. We said QRX while we look outside and find out. I don't think we ever did come back to the guy. For all we know he may still be holding the circuit open, waiting for our reply.

Inasmuch as he is one of the few Stateside persons who actually heard the commotion that morning, we now would like to establish his identity. Major Longerich recently was in the islands but was unsuccessful in locating the old K6SRZ logs for that period.

Hams, as a rule, are a patient lot. Yet we doubt that the other end of this K6SRZ QSO is still standing by waiting for the answer to his inquiry. Anyway, the ex-K6SRZ gang would like to find him. Can you enlighten W2TNC?

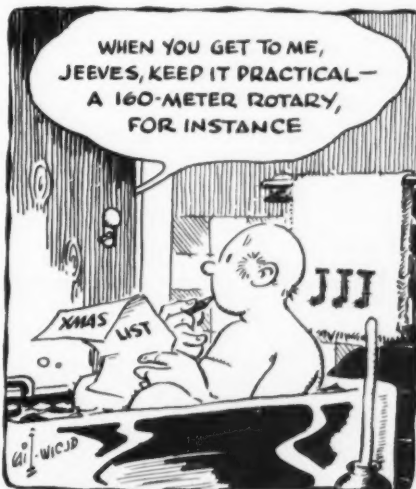
Where:

Don't overlook IARU News in this QST for it includes a revised tabulation of QSL bureaus throughout the world. KB6BA (ex-KL7CB-W0ASN-KH6AMZ), who takes over the Canton Island bureau, expects to inhabit the KH6 area for at least two more years. ... ET38 of Addis tells ZD6BX that stations he works should QRX for his cards before shipping their own QSLs Ethiopianward. ... Although Thailand—along with Cambodia, Laos, Viet-Nam, Indonesia, Iran and Korea—is still in the FCC's ban list, for correspondence purposes you can reach HS1D, James D. Fry, Jr., at JUSMAG, Box B, APO 74, c/o Postmaster, San Francisco. ... From LeRoy Waite of NNRC we learn that LU9AH, Jose Guerra, Dpto. Com. Nav. MM, Buenos Aires, Argentina, acts as QSL bureau manager for LU "Z" stations. ... VP8BE tells W6WKE he's shipping a batch of Grahamland pasteboards northward this month and expects to remain active until March. ... Notes from W2MLO: (1) MP4BBL, a Bahrain mechanic, laboriously patches up homemade QSLs until an order of 2000 arrives. He vows 100-per-cent QSL, although it may take some time to lick the zooming backlog. (2) SV0s WK and WL (K6AUU and W6ZID) who recently completed their Crete jaunt, desire stamped self-addressed envelopes be sent to them at APO 206, c/o Postmaster, New York, N. Y., by those Ws seeking deserved Crete confirmations. ... Please bear in mind that none of the addresses to follow is necessarily "official" nor can we guarantee accuracy. Thanks to Wis RDV UED WPO WPR, K2GFQ, W2WZ, W3s SOH WPG, WN3ZOG, W4s UF YDT YZC, W5WQN, W6s GPB UJ, W8CED, W9CFT, F7BM, KR6OS, ZD6BX, NCDXC, NNRC, WGDXC and 200-DXC for this rundown:

AG2BR, Bill Roth, APO 209, c/o Postmaster, New York, N. Y. ... BV1US, MAAG, APO 63, c/o Postmaster.

* New Mailing Address: Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new QTH: 5833 North Kenmore Ave., Chicago 40, Illinois.

San Francisco, Calif. ... CE2AN, Casilla 3016, Valparaiso, Chile. ... CM2XZ, Jorge Smith, 3A No. 8, Miramar, Havana, Cuba. ... CN2BA, Ahmed, R.Y. Cajal 19, Tangier Zone. ... CN8ED, L. C. Couchman (W0STP), NCF, USNAF, Navy 214, Box 50, FPO, New York, N. Y. ... CO2IP, Dolores No. 10, Sta. Amalia, Havana, Cuba. ... EA9EB, Box 662, Medilla, Sp. Morocco. ... ET2PA, P.O. Box 379, Asmara, Eritrea. ... ex-F7AZ-DI4BB, Maj. F. L. Ziegler, W3BTP/8, Box 365, Hq. AMC, Wright-Patterson AFB, Ohio. ... FB8BC, Box 587, Tananarive, Madagascar. ... FB8BN, Box 806, Tananarive, Madagascar. ... HC1LE, Box 2229, Quito, Ecuador. ... HI8WA (QSL to W4QV). ... HR1JZ, J. Zelaya, Tropical Radio, Tegucigalpa, Honduras. ... KA2KS, Box 31, Navy 830, FPO, San Francisco, Calif. ... KG6IG, Navy 905, FPO, San Francisco, Calif. ... LU7ABL (also LU8ABL and LU9ABL), Alberto O. Fernandez, Casilla 5197, Correo Central, Buenos Aires, Argentina. ... LU8DEV, J. M. Nobio, Rivadavia 620, S.L. Buenos Aires, Argentina. ... MB9BJ (QSL via RSGB). ... OQ5ZZ, P.O. Box 377, Elisabethville, Belgian Congo. ... OX3AY (QSL via EDR). ... PJ1F, 24 Jacob van Campenstraat, Heemstede, Netherlands. ... SU1MQ, c/o ISWL, 86 Barrer Rd., London N. 10, England. ... TG9EA, Rafael Arocha, P.O. Box 115, Guatemala City, Guatemala. ... ex-TI2TG, Tom G. Gabbert, 1820 Poli Street, Ventura, Calif. ... ex-VK1BA, Brian Fiebig, 48 Blackburn St., Maddington, W. Aus., Australia. ... VK9OK, Len J. King, c/o DCA, Norfolk Island, Australia. ... VQ4EG (ex-MI3TM), Box 4383, P.O. Westlands, Nairobi, Kenya. ... VQ4EZ, Box 1313, Nairobi, Kenya. ... VS1EW, Box 1158, Singapore, Malaya. ... ex-VS9AW, Cpl. H. J. Wheeler 3500323, No. 1 Regt. Stn., Chikeng, c/o RAF Maintenance Base, Seletar, Singapore 28, Malaya. ... XE5PC/M (QSL to W6MYC). ... XZ2OM, F/Lt Aung Myint, BAF, Box 1490, GPO, Rangoon, Burma. ... ZA1BB, Box No. 2, Kurec, Albania. ... ZB1AUU (QSL via RSGB). ... ZD8AA, T. Shepherd, Cable & Wireless Ltd., Ascension Island, So. Atlantic. ... ZD9AC (QSL via ZS1FD). ... ZE6JJ, A. R. Evans, P.O. Box 846, Bulawayo, So. Rhodesia. ... ZP5GM, c/o U.S. Embassy Asunción, Paraguay. ... ZS1RG, T. A. St. Johnston (G6UT), "Hauptville," Constantia Rd., Wynberg,





Left: ON4VY's installation is a good example of the more elaborate Continental ham shack. Rene operates most amateur bands and also performs duties as UBA society's secretary-general. — Right: OQ5ZZ showed up on schedule in early September, operated by UCAR personnel at the Commercial and Industrial Exhibition, Elisabethville. In the UCAR booth we find (l. to r.) OQ5s PULY RU AJ and HG. OQ5ZZ had 276 QSOs on twenty meters, 54 on fifteen, 13 on forty, 2 on eighty and 1 on ten; all continents and 59 countries were worked. OQ5CP sat in to roll up 93 of these contacts. Specially designed OQ5ZZ QSL cards are on the way.

Cape, U. of So. Afr. **5A4TS**, P.O. Box, 372 Tripoli, Libya.

Whence:

Asia — XZ2OM, whose new address appears in "Where," operates regularly on (A3) 14,120, 14,240 kc.; (A1) 14,020, 14,050 and 14,100 kc. KR608 finds him available daily between 1230 and 1600 GMT with 40 watts to an 807, a dipole antenna and an AR-88 receiver. Bad news for W1WFO and others: Ex-AP2N, according to friend W9FKC, hasn't been in Pakistan since last December. Norm now is in India and hopes to remain there permanently as a VUC2. KR608 keeps losing antennas in Okinawan typhoons; an 83K beam was the most recent casualty. "Have been disappointed by QSL returns — 64 countries worked and only 26 confirmed so far — but pleased with the fine W QSL return. Pathos seldom open for Ws during my present operating period (1000-2000 GMT)."

KA9AH is an instructor in the 1st Calvary Division's Hokkaido radio school. "The Chinese Nationalist Government has assigned the local call sign BV1US to the MAAG MAIRS station AB1US. Call sign BV1US will be used when operating on 7060, 14,050, 14,250, 21,200, 26,980, 28,100 and 29,050 kc." This from Co. W. B. Latta, USA. Thus the AB1US gang now can do business toward widely needed Formosa DXCC credits. In a note to W6SWG, CR9AF registers his expectation to become a CT1 sometime after next March.

Africa — A Mr. T. Shepherd, who penned the following excerpt to W6UJ, is about to fire up ZD8AA on Ascension Island. "This is to inform you that ZD8V is a pirate. We are being inundated with QSL cards and letters and our tiny P.O. is getting blocked with them." W8SOH hears that a USAF detachment is setting up on Tristan da Cunha. More future ZD9s? During his 6-month South African visit G6UT will be QSOing DX buddies behind the label Z8IRG. That fat 14-Mc. 'phone signal of Z85NZ stems from an 814 100-watt and 3-el. squitter. He receives with an Eddystone 750.

Oceania — From G2RO, now touring Pacific areas with his fantastic 15-watt, we receive this tentative itinerary: Solomon Islands, Nov. 22nd through Dec. 7th; Gilbert & Ellice Islands (and possible near-by stops), Dec. 30th through Jan. 12th; Coco Islands, Feb. 6th-8th; Mauritius, Feb. 8th-12th; Kenya, Feb. 12th-18th; and back in London by late February. From KB6BA re Canton ham doings: "With the departure for the mainland of KB6s AO and AY a few days ago our ham population now is down to two — KB6AQ and myself. KB6AO accepted a position with CAA in the Bay area and KB6AY is slated for Albuquerque, N. Mex." KB6s AQ and BA prefer 20 meters, A3 and A1, and the latter is rigging up a 60-ft.-high 3-el. beam while considering possible s.s.b. work. KB6BA anticipates no local VRI activity in the near future.

W6YY gleanings: VR2HZ/ZM7 knocked off 29 Ws, seven ZIs, four W4s, three W6s, two W9s, two K16s, and single W5 W7 W8 KV4 VE6 and K17 customers during his August Tokelau escapade. Bari's present assignment calls for further visits to ZM7 areas — keep QRV with that

QRO! From ZK1BG: "Lately I have been receiving many QSL cards from European amateurs for 20-meter operation in July, 1954. I have not been on 20 since before Christmas, 1953. There are two ZK1s very active on 20 — ZK1AB and ZK1BI — but I, myself, stick to 80. ZK1AB is consistently on 20 around 0400 GMT." ZK1BG regularly haunts 3512 kc. beginning at 0800 GMT.

Europe — 3A2AW (SM5ARP) made it to Monaco again this year but QSO'd just one U. S. station — W2DOD on 40. Carl admits he was very QRL having fun at Monte Carlo. SM5ARP now has 183 countries confirmed, 169 on 'phone. PJ1F, school station at Haarlem Technical College, Netherlands, aims to QSO more W/VE/VOs in the future. CT1CL gives 75-meter 'phone a try every Sunday from 0500 to 0830 GMT on 3700 kc.

F7BM, formerly the call of W8DMZ, now is used by W9TYT in the La Rochelle, France, area. F7BM has 86 countries and 42 states confirmed toward DXCC and WAS trophies. Other Yanks in F7-land include W4YDF, W5VOK, W7WJV, W8SXL, W6JEY (F7DH), W9UPM, K2ICH, K2JCS and K6CDT (F7CZ). Concerning the transatlantic crossing of British 61-foot lifeboat *Artes* (p. 58, June QST), W1RSC was of emergency assistance on July 22nd when the vessel's ship-frequency gear conked out. W1RSC, contacting the boat on 7 Mc., forwarded word of the predicament to the Coast Guard for relay to the British Admiralty, London. *Artes* made home dock okay on August 10th after 55 days and 8200 miles of ocean hardship.

South America — In QSO with W9HUZ, VP8AA confirmed the present absence of ham activity on South Sandwich and South Georgia islands. VP8s AA AZ and BE are very active from Grahamland; VP8s AQ and AX, South Shetlands; and VP8BC, Falklands, with an input of 0.2 watt. San Andres & Providencia Islands (HK0) is a country newly added to the LABRE (Brazil) WAA-award list. Newfoundland & Labrador (VO) credit for WAA henceforth will be given only for QSLs confirming QSOs made before Dec. 31st, 1954.

HEREABOUTS — FM7WN still works toward an FG7 ham-style vacation, according to W6YY. John also found XE5PC mighty popular on 20 'phone, who turned out to be W6MYC mobiling in the higher mountain reaches of Mexico. W4HQN understands that his was the only 75-meter 'phone heard by the KC4AB gang on Navassa (and while operating mobile, at that). Ex-VR2CD (VE7ASL) dropped in at ARRL Hq. on his mobile-style tour of the U. S. Chas successfully dodged windy YIs Carol, Edna and Hazel on a journey which ultimately will wind up in Hawaii. In addition to heavy editorial work on NCDXC's *DXer*, W6GPB managed to clinch a DUF-IV diploma. W6TTI, chairman for the 6th annual DX Conference sponsored jointly by the Northern and Southern California DX Clubs and scheduled for January 15th-16th at the Fresno, Calif., Hotel Californian, is standing by for inquiries and reservations at P.O. Box 75, Oakland, DXers throughout the world are welcome.

W8BDK blew into the Virgin Islands and W9NN did some Geiger-counting while in the Dakota hills. W8KBT lost his 10-over-20 and a 40-foot tower in recent breezes. Write Radio Club of Cuba, Lealtad

060, Havana, for information on their WWI (Worked West Indian) award, a certificate based on 24 QSOs with 20 Caribbean areas. . . . Please note the new QTH of your conductor, Jeeves figured it was high time we got back to the Midwest and did something about that puny 123-confirmed W9BRD countries total!

What:

In the text to follow, frequencies (given in number of kc. above the lower band-limit) appear in parentheses, times without. E.g., (9) = 14,000 kc., if the paragraph deals with 20-meter work. Times are 24-hour time, zone or GMT specified, using the nearest whole-hour figure such as 7 for 0730 or 0830, 0 for 0015 or 2345. As a rule each DX call is mentioned but once per band.

Tremendous yankings on Jeeves' tortuous grapevine confirm October and November as the hottest North American DX months in years. Gaping breakthroughs intermittently cracked every DX band from 1.8 to 30 Mc. wide open.

Ten 'phone put on a show reminiscent of late-1940s performance with every continent but Asia reported pouring r.f. into the U. S. East Coast. W4NQM heard more darned DX than he had time to work but did raise CR6BX (200), OQ5RT (300), VP8 2MY 3LF (495), VQ2FU (410), several Z8s and many South and Central Americans. Best times, between 1540 and 1730 GMT. . . . W4NQM's 28-Mc. colleagues had a ball, too, as follows. W3QYF: CE2s HD HJ HN, a CR6, CX1s BV GG, HCIR, HK5ER, HP1FA, HRI1W, fourteen LUs and ZS6QO. W3QMG: a CE2, HPIAC, LUs, PYCAES, W4ABU. CE2s HN IT, a CR6, CT1s CL GW, 14 LUs, four PYs, VQ2DT, VY5s galore, ZS6s BW OP OQ UM ZO, W4WVW a CE2, CXs 5CE 7BA, HP1s CN TS, TIERL, VY3BD, LU4AJR, CP5AB, EL10A, Hs CGE CXJ, KH6ARE, LU4AAT, CN8ML, CT1s ER EV, EA4s DU EP ER ET EU, F3VQ, KA2KC. . . . K2s AJD EFB, W3s ESE NUM OSF SLF, W4s WYM ZZA, W0BJP and KP4QA also were in there pitchin'. . . . G3IDG reports much U.K. rejoicing at the behavior of 28 Mc. Heard or worked by Gs 2YZ 3HFI 3IDG 5LB and 88Y: CRs 6BX 7IV, CX1CS, LU3AQ, OQ5RU, PY1AGP and ZS6BW.

One-sixty c.w., at the other end of the DX spectrum, continued production of transoceanic QSOs as begun in late September. W9FTM chatted with ZL2BE (97) 2 CNT with the assistance of his new 125-foot vertical. . . . W1s BB VDB and W3RGQ got across to Gs 3PU 5JU, while W3EIS also made the grade with G5JU. . . . EL2X and LU3EL are reported active on 160. When the ZC4 gang gets fired up, 1.8-Mc. WAC possibilities will be assured. . . . From W3RGQ we learn that VQ4s AQ CH FB RF, VSs 1FK 2EB 6CN 6CQ 6CZ, ZC5VS, TI2BK, HK4DP and YU1GM are looking forward to working 160-meter Ws this season. W3RGQ, together with over 30 interested top-band DX hunters, also has provided VR3A, YV5DE and others with 160-meter crystals. DX stations sincerely interested in top-band work, and whose only obstacle is lack of proper crystals, are invited to contact W3RGQ who offers his services as a center for the assembling and dissemination of 1.8-Mc. news. Between Shely and W1BB (see accompanying box announcement) this season's activity should be well nurtured and reported!

Twenty 'phone still looks good from the ARRL DXCC Countries list angle. DL4CZ helped himself to EA8BX 17 GMT and HR1CB 21, while W9EU raised HH3DL (180) 10 CNT and H16EC (176) 18. . . . Two's KA0JL (235) 7, KR6KS (220) 7, KX6AF (230) 7, VP2DN (60) 15 and VS2EB (145) 7 answered W5UUK, times CNT. . . .

Shiekdom of Qatar station MP1QAH has been the object of high 14-Mc. pursuit for many months. The shack's exterior appears at left, designed to ward off Persian Gulf three-digit temperatures. The shack, at right, combines a commercial point-to-point layout with ham-band gear. (Photo via G4U)

160-METER TRANSATLANTIC TESTS

Plans for the 1954-1955 series of 160-meter DX tests, as arranged by interested U. S. A. and British amateurs, have been completed and all "Top Band" stations throughout the world are invited to participate. Conditions are expected to be good, for transatlantic and New Zealand-U. S. A. contacts occurred as early as October 9th. Regular nightly activity is anticipated and concentrated efforts are recommended as follows.

Dates: December 5th and 19th; January 2nd, 16th and 30th; February 13th.

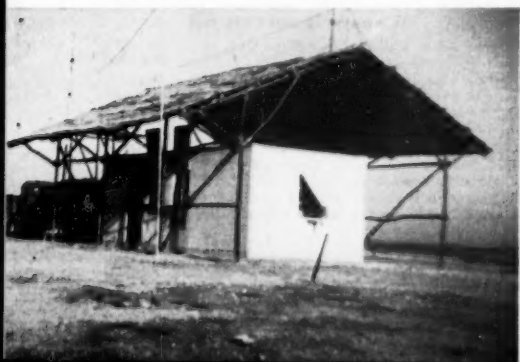
Times: The period between 0500 and 0800 GMT is recommended. W and VE stations are urged to transmit on the hour for five minutes, listen for DX answers for five minutes, transmit for another five minutes beginning the tenth minute after the hour, etc., until DX contact is established. Transmissions by DX stations will commence five minutes after the hour and continue in like fashion. Take care to maintain time-piece accuracy! Use the call "CQ TEST" if desired. Contacts should be kept short to ensure maximum opportunity for all participants.

Frequencies: Look for G stations on their assigned band, 1825-1875 kc. ZIs will be using their 1875-1900 kc. segment. DX stations are urged to tune all W/VE sectors—1800-1825, 1875-1900, 1900-1925 and 1975-2000 kc.

Reports: Stewart S. Perry, W1BB, 36 Pleasant Street, Winthrop, Mass., will appreciate reports from participating W/VE stations. DX stations can communicate their results to L. H. Thomas, G6QB, Forest Barn, Turkey Road, Bexhill, England. Good Luck!

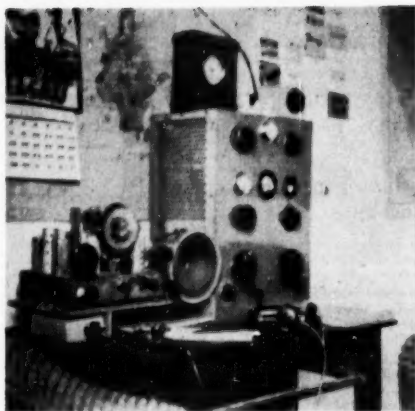
Note: See text for news of additional organized 160-meter activity sponsored by the Top-Band DX Club and W3RGQ.

For the "200" DX Club, W5KUC records the 14-Mc. radio-telephone availability of one AC4NC (100), CR8GJ (158) 14-17 GMT, FR7ZA (120), FU8s AA (200) 5, AB (200) 5, HE1LAA (103), KC6s AA (234), ZB (210) 14-16, MP4QAH (132-185) 15-16, OY2Z (145) 15, PX1YR (125), LZ1s KDP (120-150), KPZ (120-150), VQ6LQ (71), VP8s AA (148) 0, AK (125) 0, AQ (130) 0, BC (125) 0, VR3A (140), VSs 4HK (95-100) 15-16, 9AS (100) 18-19, VU: 2RX (160-190) 16, 5AB (140), YA1AA (198), YK1AJ (142), ZAI1BB (165) 14, ZCs 1AC (165), 3AC (120) 10, ZM6AT (165), 4S7s BR (105) 17, LM (105) 16-17, YL (95-100), 4X4DK (207) and 9S4BS (140) 15. . . . W5FXN, scribe for the West Gulf DX Club's DX Bulletin, specifies 20-meter A3 activity on the parts of CRs 6AC (111) 22 GMT, 6BX (113-148) 22, 6CS (32) 21, 7AR (150) 14, EL2X (190) 2, ET2ZZ (150-190) 16-18, FQ8s AK (114) 23, AQ (107) 21, AR (116) 23, AT (135) 20, FY7YE (300) 15, GD3HBQ (178) 15-16, HE9LAA (95) 14, OQs 5AO (110) 19, 5FN (113) 20, 6DZ (139) 20, ST2NW (144) 20, TF5SV (107) 16, VK9s BS (193) 14, CR (140) 14, DB (191) 14, GV (124) 14, OK (164) 2, YT (201) 13, VQs 2DC (125) 21, 2DI (160) 21, 2DT (120) 20, 3AV (130), 4EZ (137) 19, 4RF (187) 20, VP: 2DA (140) 14, 3LF (150) 22-23, YU2DC (152) 22, ZBZA (112) 18-19, ZDs 3BFC (107) 21, 4BL (113) 21, ZE6JJ (118) 21, ZM6AL (162), 3V8s AN (210) 20-22, BB (195) 20-21, 4S7FG 17 and 4X4GT (131) 15. . . . News & News Radio Club 20-'phone luck: AG2s AB BC, CN2AD (175), CP5s AQ/CP6 (230), AV EK ES, CR4s AD (135) 16, AL (125), CS3AC (321) 19 ENT, EA: 6AW 6BS 8AP 15, 8BG 16, 8BL 8EE,



EL6A 16, ET2LV 17, FM7s WN WU, FO8AB (160) 23, HZIAB, ITIBXX, KG6AAY 16, KR6s AZ OY, KT1s NX PU (350), UX (95), KX6s AF BU, LX1s BU DG, MF2AA, OD5s AB 15, BA, OQ5s FO GM (170), VP, PJ2s AF AQ (160), SP3AK, SU1s MR SW 13-14, SV0WO, TA5 2EFA (200), 3AA, TG6s AB BA RV, VP6 1GG 18JC 2AD 2DL, ZDN 7NG 7NS 7NU 7NV, VO6 2FU (140) 14, 4NZK (135), VS 1BT 1FF 1FS 2DS, YN6s IAFM 3ET, YS1s JR MS (185), 0 YU1GM, ZB1s CA CM (185), ZC5VR 15, ZD4BK (115), ZM6AC, ZS7C 17, 3V8AS, 4X4s AB AM, 5As 1TZ 2TZ (325), 3TC 3TE (115), 4TR (110), 4TS (95) and 4TU 15.

Twenty c.w. is still around, to put it mildly. W2WZ worked DU7SV (90) 13 GMT, FK8AO (39) 13, FR7ZA (18) 13, KM6AX (62-107) 2-20 on both paths, VK9OK (73) 2, VP8AA (51) 21, VR2s CG (17) 13, CY (19) 2-3, VS 4HK (80-100) 13-16, 6CG (91) 13 and ZE6JJ (17) 12 13. W9KXK concentrated on LU "2" callers: 1ZS (48), 4ZB (20), 7ZM (32), 7ZO (45), 8ZS (60) and FO8AG (85), reaching 121 confirmed. W9HUZ, who still needs a few states for WAS despite 216 DXCC countries worked, bagged CP3CA (60), VK9AU (68), VP3FD (54), VO3CC (70) and ZS9I (73). CRs 6CS (80) 14-15 CST, 7LU (75) 15-16, CT2HO (5) 11, EASHP (50) 14, F9QV/FC (36) 16, FO8AX (52) 14-15, FY7YE (57) 17, HA7OL (49) 8, HR1MC (35) 17, LB8YB (37) 7 in Greenland, LU5 ZCC (30) 7, 4ZL (31) 16, LZ1KAB (77) 12, MD5FH (23) 8, OQ5s GU (41) 17, PE (83) 16, RU (86) 18, OX3UD (46) 14, VO4s CG (28) 13, ERR (14) 14, FK (55) 16, Y2AM (25) 9, ZD2DCP (77) 15 and 4X4AM (62) 13-14 responded to W9EU. Alex still stalks FB8s BE (20) 13, ZZ (22) 13-14, HZIAB (16) 8, VO6LQ (58) 8, ZC7s BB (57) 14, AM (67) 15 and ZS7D (56) 13. W5UUK did well with CR6AI, CT3AB (7) 19 CST, EA9s EB DF (78) 19, FM7WD (110) 7, Trieste IYCV, ISIAHK, KX6BL, OD5LC (18) 17, SP3AN, TFs 3AB 8SV, ZD4BT (69) 19, ZPs 5GM (66) 18 and 9AY. DL4ZC raised FM7WP 20 GMT, FO8AG 19, ISPP 18, VP8AO 20 and VS9AN 19. DU9JO, ET3S, FB8s BC BN XX, MP4QAH, OD5s AV LJ LX, ST2s AR (30) 20 GMT, NG, SVIAB, VK1EG of Antarctica, VS 1EW 1YN 9AS, VU2s CS RX, ZB1s AJX and BU were happy to land ZD6BX. Nifties snagg'd hither and yon, at W6GVZ: LZ1KSP, ZD6HX, W3WPG: ZB2A, W4YZC: a CR6, FO8AF, SL3AG, an ST2, W6GPR up to 199 with HI8WA (100) 13 PST, VK9RH (72) 19 of Norfolk, W6UED: LU1ZT, W9APY/5: CS3AC (45) 1 GMT, an EL2, JA6AK (80) 15, LU1ZL (85) 0, KR60S: ZS3AH (25) 20 GMT. WGDXC recommendations for 20 c.w.: CETAA (53) 0 GMT, EA8BF (38) 21, ETs 2PA (60) 20, 3R (60) 20, FF8s AJ (71) 22, AP (75) 21, FO8s AB (90) 3, AG (60) 2-3, FO8s AA (51) 18-19, AR (71) 21, FW8AB (80) 3-6, IYCA/Trieste (28) 19, LU9ZM (84) 0, MP4BBL (70) 15, OQ5BB (15) 20, OX3s EL (50) 17-18, UD (60) 15, SV1SP (100) 21, TA3AA (20) 13, TG9AZ (40) 20, VO6s 2AB (66) 20-21, 2GW (65) 21, 4BNU (37) 19, 20, 4EI (40) 70, 19-20, 4EN (37) 20, 4EZ (20) 18-20, VS1BJ (80) 15, ZB1CH (47) 20, ZC4GF (40) 18, ZD4AQ (42) 21, 4X4s BX (18) 16, FA (37) 17 and 9S4AX (97) 16. No. Calif. DX Club's Dyer adds candidates C3AR (20) 21-22 PST, CN2BA (20) 13, CRs 6BW (70) 11, 7AF (50) 11, FF8GP (95) 13-14, IT1TAI (50) 10, KG6IG (60) 20-21 of Chichi, MF2AG (20) 8, ST2AC (22) 9-10, TA2EFA (45) 11, TF3AB (52) 10, VPs 7NG (10) 14, 8BA (68) 16, VR3A (51) 18-19 and ZM6AL



EA6AW is good for a fast Balearics Islands QSO and QSL. A 28-watt rig and 5-tube super are served by a 68-foot inverted-L antenna. (Photo via W5UUK)

(42) 19-20 to the 14-Mc. DX grab bag. HA5KBA (49) 13 EST, JA5 4AF 6AD 8CA (70) 19, YO3s RD RF and ZC4PB (50) 17 are among K2BZT's large collection. W8PCS accounts for CR4AL (65), GC2FZC (63), VO2JN (75) and other goodies already mentioned.

Forty c.w. treated Mississippi's W9APY/5 to EA8BF (20) 3 GMT, FO8AC (33) 6, HC1LE (30) 4, HR1JZ (20) 4, KG6FAA (47) 11, LU5 4ZB 6, 7Z0 7, SU1FA (20) 0, TG9AZ (30) 2, VP8s and many ZIs. CN8GC, EL2X (15) 7 GMT, LZ1KAA, ZD2DCP (12) 0 and ZE6JJ (30) 0 answered W3WPG. Harold's XYL WN3ZOG found CM7JA, KP4UE and WP4YD workable on Novice frequencies. W6s MPY OYS RW SA SWG VBY and VUP contacted ZD6BX around 1630 GMT. ZD6BX also hooked 7-megacyclers JA5 1XR/JA0 3AA 5CP 6HK, VK11DY, VO3s CC DR, VS2CR and VU2BY. CT2HO (18), CX6AD (15) 5 GMT, HK0AI (40) 3 on San André, KC6AA (10) 11, KM6AX (20) 7, LU2ZI (8), TG9AF (19), VK1GA (30), VP8s AA (45), AZ (18-40) 5, BE (3-20) 4-6, VP2SH (31), VR2BZ (31-45) 9, ZE5 3JO (12) and 5JJ (53) fattened W9HUZ's 40-meter ledger. According to 200-DXC

advices, FR7ZA and VO8CB schedule on 7007 kc. at 3 GMT. W7JLU nabbed FO8AK (25), HR1MC (60) 4-5 GMT, JA8AQ (35), LU1s ZS (20) 15, ZT (15) 8, TI2BX, VKs 1AC 9PF (5) 9, VPs 6GT 6PG 8AO (15) and others. 7-Mc. good fortune at this shack and that shack — W2ENO: HA5KBA, an HK0, LZ1KDP (10) 21 EST, SU1WW (6), ZB1BV (28) 12, W2QBB: raised a CT2, heard PJ2CE (30) 20 EST, W2WZ: FR7 HK0, LU9ZM (22) 7 GMT, VP8AE (16) 5, W4YZC: an EL VP8, FA8DA, W8PCS: a Grahamland VP8, W9KXK: a Macquarie Island VK1, W0QTA: VR2AS 8-9 GMT, DL4ZC: So, Americans and TI2PZ 23-0 GMT. The WGDXC boys annotated 7-Mc. items DU7SV (27-40) 8-10 GMT, FB8NX (20) 2, FG7XA (7) 3, FK8AB (22) 8, JA5 1FA (17) 10-11, ZBL (20) 12, ST2NG, VP3AT (3) 5-6, VO6LQ (25) 15, VR2CG (18) 12, ZDs 3BFC (40), 4AB and ZM6AL (5) 7.

Forty 'phone was tagged for C08s, KG4AE (207) 7 EST, KH6FAA (204) 7, TI2WZZ (265) 23, VK3ATN (135) 7, VPs 5DX (195) 6, 9BU (255) 18-19 and ZL1BY (150) 6-7 by WIAPA. NNRC ears heard 7-Mc. A3ers

(Continued on page 168)



HK0AI singlehandedly represents San Andres & Providencia Archipelago on the ARRL DXCC Countries List. Vic regularly is found on 40 meters where he enjoys his exclusive DX status and popularity.

QST for



CONDUCTED BY E. P. TILTON,* WHDO

Any good v.h.f. man knows that September and October are the wrong months to be away from home. This was never more true than in 1954; your conductor was only two days out on a 7-week western tour that started Sept. 2nd, when things began popping. Since the early '30s Labor Day week end has marked the beginning of the fall v.h.f. DX season, but with our much-improved equipment and more widespread activity records toppled this year as never before.

Just compare the 2-meter states-worked box in November QST with the one appearing in these pages and you begin to get the idea. New states were being added everywhere; one operator reaching a grand total of 29! The 220-Mc. record was extended for the first time in two years and now stands at 700 miles. Two-way work was done on 144, 220 and 420 Mc. over many paths that would have been considered impassable to v.h.f. signals only a few years ago. It was a good fall!

Checking of the September V.H.F. Party logs, just being completed as we write, shows 373 reporting. This pushes the fall party just a few logs ahead of the spring affair, and that one set a record for participation and reporting. Growth of interest is particularly in evidence in the Middle West and in W6 and W7. Activity in our v.h.f. parties was once largely confined to the north-eastern seaboard states, but it is no longer that way.

Proof: 155 contacts on 50 and 144 Mc. by W9WOK, Bensenville, Ill.; 131 on 144 Mc. alone by W9KLR, Rensselaer, Ind.; 196 in 17 sections on 144 Mc. only by W8WV, Shiloh, Ohio. In Oregon, W7OKV worked 60 stations on 144 Mc., and W7UFE and W7PVZ/7 lead the Washington Section with 63 and 83 contacts on 2 meters, respectively. You had to do better than 100 contacts to rank near the top in most of the California sections. Reporting was way up from W6-land, particularly from the Los Angeles Section, where W6WSQ made 230 contacts on 50, 144 and 220 Mc. Contest details and scores next month.

September-October DX

The big doings of Labor Day week end are rather ancient history by now, but even at this late date some highlights are worth noting. W4UMF, Arlington, Va., reports Wisconsin and Michigan stations coming through on 144 Mc. as late as 1100 on the 4th, with the band opening again in a westerly direction about 2000. At 2055 EST Tom hooked up with W8BFQ, West Richfield, Ohio, on 144, shifting to 220 Mc. shortly thereafter, for what was probably the first Ohio-to-Virginia contact on that band. W2QED, Seabrook,

N. J., also was busy on 220, working W8s SVI LPD DX RFQ and NRM, either two-way or crossband 220-144.

A big event for eastern stations was the appearance of (for most of them) their first Kentucky signal on 144 Mc. Working as fast as possible, W4PCT, Covington, provided contacts with his state for 2 Massachusetts, 6 Connecticut, 12 New York, 16 New Jersey, 1 Maryland, and 14 Pennsylvania stations between 1922 and 2330 CST. W8BFQ worked the same number of stations as W4PCT on 144 Mc., 52. Here were divided between 6 W1s, 18 W2s, 8 W3s, 8 W4s, 4 W5s, 6 W6s, and 2 VE3s. Margaret also worked W4UMF, W3SUK MRQ/3 LZD, and W2s QED FBZ DZA RFV, W8DX and W9OVL on 220 Mc. On 432 she worked W3RE, W3MRQ/3, W2QED, and was heard by W1VNH, Agawam, Mass. This last one would have been a new record if Harold had not had feeder trouble on his 432-Mc. beam, preventing him from making it a two-way.

Probably never before in v.h.f. history had there been such mass work over the Allegheny Mountains, but we suspect that this general success was more the result of improved equipment and polarization standardization than of exceptional fall conditions. These 400- to 800-mile contacts are being made increasingly often over mountainous paths, and getting both areas on the same polarization seems to have been an important factor in this. We feel reasonably sure

50

WAS

Mc.

W0ZJB	48	W5VY	48	W9ZHB	48
W0BJV	48	W5NQ	46	W9QUV	48
W0CJS	48	W5ONS	45	W9HGE	47
W5AIG	48	W5JTI	44	W9PK	47
W9ZHL	48	W5ML	44	W9VZP	47
W9GCA	48	W5EFW	44	W9RQM	47
W6DB	48	W5JLY	43	W9ALU	47
W0UNI	48	W5JME	43	W9QKM	46
WHDO	48	W5VV	42	W9TIA	45
W5MDJ	48	W5PAL	41	W9UNS	45
		W5ESC	41	W9MFH	36
W1CLS	46	W5HLD	40		
W1CGY	46	W5HEZ	38	W0QIN	47
W1LLI	46	W5FCN	38	W0DZM	47
W1GJO	45	W5LIU	37	W0NFM	47
W1LSN	44			W0TKX	47
W1HMS	43	W6WNN	48	W0KYF	47
W1DJ	41	W6ANN	45	W0JOL	46
		W6TMI	45	W0HVV	46
W2AMJ	46	W6IWS	41	W0HVV	46
W2MEU	46	W6OVK	40	W0MVQ	46
W2RLV	45	W6CGG	35	W0WKB	45
W2IDZ	45	W6BWC	29	W0TJF	44
W2FIJ	44			W0JHS	43
W2GVY	40	W7HEA	47	W0PKD	43
W2GVH	38	W7ERA	47	W0PI	41
W2ZUW	35	W7BQN	47		
		W7IDJ	46	VE3AET	43
W3QJ	46	W7DYD	45	VE3JNY	42
W3NKM	41	W7JRG	44	VE1QZ	34
W3MCU	39	W7RWC	42	VE3AIB	32
W3OTC	38	W7JPA	42	VE1QY	31
W3KMY	38	W7ACD	42	VE3DEE	27
W3RUE	37	W7FIV	41	NEIGE	25
W3FPH	35	W7CAM	40	CO6WW	21
W4FBH	46	W8N8S	46	Calls in bold face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.	
W4EQM	44	W8NQD	45		
W4QN	44	W8TZ	45		
W4IPZ	42	W8RFW	45		
W4FLW	42	W8MS	43		
W4XCC	41	W8SQU	43		
W4MS	40	W8BFQ	42		
W4PNR	39	W8YLS	41		
W4IJJ	38	W8OJN	40		
W4BEN	35	W8LPD	37		

* V.H.F. Editor, QST.

that the trend to horizontal polarization now showing in some western areas will prove equally beneficial to W6s and W7s who are interested in extended-range work.

October produced v.h.f. DX sessions at least equal to the best that September had to offer. On the morning of Oct. 8th W8BFQ found W4HHK, Collierville, Tenn., and W5RCI, Marks, Miss., coming through well on 144. Contact was made with W5RCI, for a switch to 220 Mc. Rex heard Margaret at once, but she was not able to read his 'phone. W5RCI then rigged a keying method and at 0910 EST they made it two-way on 220, for a new record of 700 miles.

The band remained open throughout the morning and into the afternoon. W8BFQ made her first contact on 144 Mc. with W5JTI, Jackson, Miss., and skeds were kept hourly. Tim got W5HQC, Rayville, La., on the air during noon hour, and this netted state No. 29 for W8BFQ. They worked solidly on voice at 1421 EST, over a distance of about 850 miles. Then followed numerous attempts at new states each way, but it being midday, activity was low. W8BFQ heard W5FSC, Houston, Texas, and W4UTF, Pensacola, Fla., weakly several times, but no contact could be made. W5JTI and W8EP, Terra Alta, W. Va., were also on the edge of a QSO but never quite made it.

Oct. 8th to 10th was good farther east, also. W3BNC, Hagerstown, Md., worked W4PCT, Covington, Ky., W9MUD, Decatur, and W9UED, Belleville, Ill., W0HHD,

to someone trying to use voice, but W1YQI, Marblehead, Mass., had better luck on Sept. 14th. Coming across some strong aurora signals just before 0630, but having no provision for keying, Bill tried calling W8WXY on 'phone. Al came back, and later shifted to voice, also. Though the signals sounded "like someone shouting into an empty barrel on a moving freight car," they managed a two-way on voice, and W1RFU, Wilbraham, Mass., made it on voice shortly after. These distances, 600 and 525 miles, respectively, are the best we've heard of being worked on voice during a 144-Mc. aurora opening. High power (4-125As at both W8WXY and W1YQI) and the 64-element array 105 feet high at W8WXY undoubtedly had quite a bit to do with this.

The "mountain complex" is gradually being dissipated. As the result of numerous demonstrations of what is now known as "knife-edge refraction" (see October, 1953, QST, page 65) and greater familiarity with the scattering effects that come into play when high power and large antennas are used, more and more v.h.f. men are working out from "impossible" locations. A recent example is the work of W7VMP, Phoenix, Ariz. This station is manned by the Fenwicks, who first made the pages of QST (April, 1952) as amateur radio's first licensed triplets.

They now live in Phoenix, Ariz., where they have a kilowatt rig (pair of GL-592s in the final), a 32-element array and a Teraft converter. With this set-up it was no time at all before W7VMP (they also hold the calls W7VMU VMQ) began working beyond the mountains, to points never before worked from Phoenix on amateur frequencies above 60 Mc. First came W7JU, Boulder City, Nev., a 240-mile shot, made first on Aug. 22nd. What is believed to be the first California QSO on 144 Mc. from Phoenix came on Sept. 5th, with W6BYE/6, on Santa Rosa Peak. New Mexico was added on Sept. 15th, with W5FAG/5, Mt. Withington. Perhaps the most significant contact was W6NLZ, Los Angeles, 357 miles, Sept. 18th. If there was ever a QSO to dispel the "impassable mountain" complex that has gripped western v.h.f. enthusiasts for a generation, this was it — home-station to home-station over mountains as rough as you're likely to find anywhere. And to prove that it was no one-shot proposition, another contact was made Oct. 20th.

Schedules are now being kept with W6QKI (ex-W3QKI) Sherman Oaks, Calif. (Los Angeles area), regularly. Beginning Oct. 15th, this sked was kept successfully 6 out of the first 7 days. Signals are weak, but in there regularly. Similar results are being achieved with W5VWU, Albuquerque, N. Mex., following a first contact Oct. 21st. This is a 330-mile hop over very mountainous terrain. Best DX to date: W6ZAT/6, Mt. Pinos, 417 miles, during the September V.H.F. Party. Interest in this sort of work is growing rapidly. W7KFS is also on with high power and doing well, and W7FGG will be in there shortly with high power and a 64-element array.

There have been scattered reports over much greater distances from both Arizona and New Mexico recently. W5VWU was heard during the contest by W0TJF, Brainerd, Minn., nearly 1000 miles. John has 500 watts and a 32-element array. Meteor-scatter tests between W5VWU and W4HHK are producing some signals, though no communication-quality stuff as yet. W7UPF reports reception of an unidentified W0 on Sept. 20th, and has received information that W0COP, Des Moines, Iowa, heard him at about the same time.

A fireball seen in the skies east of Albuquerque the night of Sept. 18th appears to have been responsible for several 144-Mc. DX heard reports, though the W0TJF reception (2110 CST) report is about a half hour ahead of the fireball observation. W5VWU saw the phenomenon, aimed his beam at it, and heard several fluttery signals but was not able to identify them. We'd like to collect more information on this one, including specific details on the report of reception of W7VMP by a station in Nebraska. Will anyone who was in on this (time: around 2130 CST, Sept. 18th) please fill us in on details?

Some rather extensive antenna rebuilding projects are under way along the Atlantic Seaboard as the result of the damage done by the several hurricanes that passed our way this fall. W2BLV gives a partial list of 2-meter antenna and/or tower casualties: W2s EH PAU GLV EDA YRW UCV QED FXT VX ZUL, W3BIB, W4s UBY and JCI. These go a long way toward accounting for the quiet state of the 2-meter band we've noted since our return from the West.

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1917
144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951
220 Mc.: W8BFQ — W5RCI
700 Miles — October 9, 1954
415 Mc.: W1RFU — W4VVE
410 Miles — June 12, 1954
1215 Mc.: G3QC/P — G8DH/P
100 Miles — July 26, 1953
2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1917
5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945
10,000 Mc.: W7JJP/7 — W7OKV/7
109 Miles — August 8, 1954
21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1916

Overland, and W0ETJ, Elsberry, Mo., on the night of the 8th, and W0YRX, St. Louis, the night of the 9th. This was a "pipeline" to the St. Louis area, with W0YRX running S8 to 9 for about 1½ hours beginning about 2215 EST.

This period netted three new states for W2BLV, Haddon Heights, N. J. George was hearing several W0s and 0s shortly after midnight of the 8th. At 1000 on the 9th, W4HHK was heard calling CQ and later working W3AIR and W4AO. W2BLV raised him at 1045, at which time the signal of W4HHK was running about 82, with occasional S9 bursts. Paul was having trouble making contacts, as there was little activity to be found at that time of day.

W0HHD, Overland, Mo., used this session to catch W5HQC, W2UK and W3BNC, Louisiana, New Jersey and Maryland, bringing his states-worked total up to 24. Now that there is 2-meter activity in just about all areas east of the Rockies, openings of this sort begin to show something of the DX possibilities of the 2-meter band. A circle of 800 miles radius takes in a lot of territory!

Here and There on the V.H.F. Bands

While aurora contacts have been made now and then with voice on 50 Mc., modulation of any sort has been largely unintelligible on 144 Mc. in most aurora sessions. Usually, if you hear a continuous roaring noise on 144 Mc. during an aurora you can take it for granted that you're listening

2-METER STANDINGS

Call	States	Areas	Miles	Call	States	Areas	Miles
W1RUF	19	7	1150	W6W8Q	3	3	1390
W1HIDQ	19	6	1020	W6RAZ	3	2	320
W1CCH	17	5	670	W6NIZ	3	2	360
W1IZY	16	6	750	W6MMU	2	2	240
W1AZK	14	5	650	W6GCG	2	2	210
W1MNF	14	5	600	W6QAC	2	2	200
W1HNS	14	5	630	W6EXH	2	2	193
W1KCS	14	5	540				
W1DJK	13	5	520	W7VMP	4	3	417
W1MMN	10	5	520	W7JH	3	2	247
				W7LEE	3	2	240
W2ORH	23	8	1000	W7YZU	3	2	240
W2UK	23	7	1075	W7JUC	2	2	140
W2NLY	23	7	1050	W7RAP	2	1	165
W2AZL	21	7	1050				
W2QED	21	7	1020	W8RFQ	29	8	850
W2HIV	19	7	910	W8WXY	25	8	1200
W2OPQ	19	6	720	W8WJG	25	8	775
W2UTH	16	7	880	W8RMH	20	8	690
W2PAU	16	6	740	W8WRN	20	8	670
W2DWJ	16	5	632	W8DX	20	7	675
W2PCQ	16	5	650	W8BAX	19	7	655
W2JHL	16	5	550	W8EP	18	7	800
W2DFV	15	5	550	W8TKS	18	7	720
W2AMJ	14	5	550	W8RW	17	7	630
W2AOC	14	5	450	W8WSE	16	7	830
W2QNZ	14	5	400	W8SRW	16	7	700
W2BRV	14	5	390				
				W9EFX	23	7	725
W3RUE	23	8	950	W9FVJ	22	8	850
W3NKM	19	7	690	W9LQC	22	8	820
W3BNC	18	7	750	W9RJR	21	7	690
W3EPH	18	7	720	W9BPV	20	7	1000
W3KWL	16	7	720	W9LCH	20	7	750
W3LNA	16	7	720	W9RIM	19	7	660
W3IBH	16	5	570	W9RIM	19	7	660
W3GKP	15	6	800	W9LF	19	7	800
W3TDF	13	5	570	W9ALU	18	7	800
				W9JGA	17	6	720
W4HHK	26	8	1020	W9WOK	17	6	600
W4AO	22	7	950	W9ZHL	17	6	600
W4PCT	20	7	950	W9RMB	16	7	690
W4JFV	18	7	830	W9BOA	15	6	660
W4MKJ	16	7	665	W9LEE	15	6	780
W4UME	15	6	600	W9NZ	15	6	560
W4ONC	14	5	500	W9DID	14	5	700
W4JHC	14	5	720	W9FAN	14	6	680
W4WCB	14	5	740	W9QKM	14	6	620
W4TCR	14	5	720	W9DSP	14	5	700
W4BY	14	5	435	W9ITA	12	6	540
W4IKZ	13	5	720	W9ZAD	11	5	700
W4JFU	13	5	720	W9GTA	11	5	540
W4ZBU	10	5	800	W9JBF	10	5	760
W4TUD	10	5	850				
W4TLA	7	4	850	W0EMS	25	8	1175
				W0HID	24	7	870
W5RCL	21	7	925	W0LJD	22	7	1065
W5JTI	19	7	1000	W0ONQ	21	6	1090
W5QNL	10	5	1400	W0INI	14	6	830
W5CVW	10	5	1180	W0RAV	14	5	725
W5AJG	10	4	1260	W0ZIB	12	7	1097
W5MWW	9	4	570	W0WGC	11	5	760
W5ML	9	3	700				
W5ABN	9	3	790	VE3AIB	20	8	890
W5ERD	8	3	570	VE3DIR	18	7	790
W5VX	7	4	740	VE3BQX	14	7	790
W5VY	7	3	1200	VE3DR	13	7	800
W5FEK	7	2	580	VE3BPH	12	6	715
W5ONS	7	2	950	VE3AQC	11	7	800
				VE1QY	11	4	900
WZL	3	3	1400	VE2AOK	10	5	530
W6PJA	3	3	1390	VE1FJ	2	1	365

S.s.b. on 144 Mc.? Some time ago we reported a W0 as being possibly the first user of s.s.b. on 144 Mc. This brought out the fact that W2JJC, New Market, N. J., has been on since March, his first contact being with K2BJP on the 27th of that month. At that time he had an output of only about one watt, from a 6J6. More recently, an 832A at 30 watts peak has been added. The signal has been received with excellent results by many users of crystal-controlled converters, including W2MIN, some 50 miles distant. The antenna up to now has been a temporary affair lashed to the boom of a 20-meter beam, but a better array is under construction. Arnold says he's heard that a Virginia W4 is also on 2-meter s.s.b. Any others?

Use of the 220-Mc. band for regular nightly rag-chewing is gathering momentum in a number of our metropolitan areas. W0OFZ writes that W0OFY OFZ MUP ORZ HPS and PYC are active regularly in and around Minneapolis. W0OFY heard W9DRN recently. The boys would be glad to keep schedules with other 220-Mc. operators.

W4EUK, whose letter in September QST, "A Technician Speaks," stirred up quite a hornet's nest, says that it also brought him in contact with several fellows in the Atlanta area who were interested in 220. W4JX, among them, has already been worked two-way on 220.

Anyone interested in 220 around Cleveland should check the band at 2130, as this is the standard meeting time for

the six or more stations active on the band. This information is from W8NRM, who is net control for the Cleveland V.H.F. Club. On Monday evenings there is regular activity on 50, 144 and 220 Mc. at 2000 on all three bands. Novice interest in 144 Mc. is high.

There is activity on 144 Mc. in Singapore and Malaya. A report from VS1FP, now back in England, tells of 2-meter interest in VS1 and VS2. He and VS1FJ started the ball rolling, and were soon joined by VS1AG and VS1AD, first in crossband work with 20 supplying the other link. The first two-way work on 144 Mc. was done on October 11th by VS1FP and VS1AD. VS2EB was first worked on October 20th. Several others are in various stages of getting on 144 Mc., and prospects look good for some real activity. The locations are close to the Equator, and many interesting over-water shots should be possible if stations can be found to work in the right places. VS1FP reminds potential VS two-meter enthusiasts that the band there is 144 to 146 Mc.

H. E. M. Stevenson, W5DNN, HC2OT, CO2IF, W5BR

In the high m.u.f. years of 1946 to 1951, few amateurs did more to promote international DX on 50 Mc. than HC2OT, Guayaquil, Ecuador. Steve kept a constant check on the frequencies near the 50-Mc. band, and by comparing notes with men of like interest all over the world on 14 and 28 Mc., he missed few chances to make DX contacts on 50.

Such diligence paid off, and before the sunspot cycle petered out in 1951, HC2OT had worked more than 150 stations on 50 Mc., in 26 states and nearly every country of South and Central America where there was 6-meter activity. To commemorate these history-making QSOs, Steve created the Order of Tropical Tramps, sending beautiful Father Neptune certificates to all whose 50-Mc. signals crossed the Equator to work HC2OT.

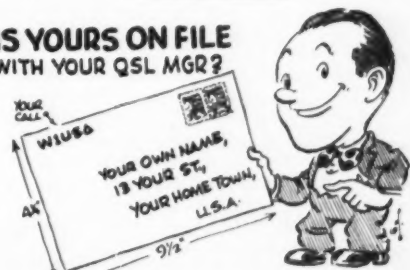
In 1951 this famous station passed into history, when Steve's work with a construction firm specializing in large-scale projects in Latin America took him to Cuba. Soon he was on the air there, too, and as CO2IF gave many Ws their first 50-Mc. contact with that country.

Then followed a short period on 10, 6 and 2 from Houston, Texas, under his old call, W5DNN, and later, W5BR. But before long he was off to Latin America again, this time to Northern Chile. Before he had a chance to get on the air as a CEI, Steve was transferred to Lima, Peru. There, as OA4DX, he worked principally on 14 and 21 Mc., but kept a watchful eye on his pet band, 50 Mc.

When we last heard from him he was in Colombia, filled with enthusiasm over his promising location, and hoping soon to be trying for 50-Mc. DX as an HK. This was not to be; late in the summer he came back to his home town for treatment of an old ailment, and on September 23rd he passed away in a Houston hospital.

Steve's ham activity began back in the spark days. In the years just prior to World War II he was active on 20, 10 and 5 meters as W5DNN. During the war he served as an officer in the Army Engineers in the China-Burma-India Theater. It was probably as HC2OT that he was best known. His cheery voice and competent fist will be missed by DX men as well as v.h.f. men, for he ranked high in both circles. With a rare combination of friendly relaxed manner, technical competence and operating skill, Steve made friends, as well as contacts, on whatever band he used.

IS YOURS ON FILE
WITH YOUR QSL MGR?





Operating News



P. E. HANDY, WIBDI, Communications Mgr.
R. L. WHITE, WIWFO, Asst. Comm. Mgr., C.W.
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coordinator
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone
LILLIAN M. SALTER, WIZJE, Administrative Aide

CONSISTENT individual merit in traffic performance is receiving recognition in the awarding of ARRL Traffic Medallions. SCM reports of traffic handled in June, July and August indicate 28 operators first-eligible for the medallions. As we go to press we're awaiting the signed statements from medallion winners confirming "for the record" that the totals were run up at one's own station, reported on time to the SCM, and that operational work included was all done on amateur frequencies. Starting next month the calls of those currently receiving Awards will be noted on the same page as the BPL.

The numerous amateur nets, c.w. and 'phone, are now in high gear for dispatch of routine and emergency traffic throughout the U.S.A. and Canada. This is just to invite one and all to take some part in amateur traffic work; at the least why not gain the procedure know-how of the real communicator by starting a few messages in your section or local net? The latch-string is out. Just about every net welcomes reporters in its sphere of operation, especially if you come up with a message to be relayed. The SCM is reserving a BPL card for you, every month you can make it. Consistent work reporting into the basic section nets in NTS may put you in line for a medallion. See full rules with the announcement of this Award, page 64, August 1954 QST. Get started in traffic today; a radiogram to ARRL asking will bring a copy of *Operating an Amateur Radio Station* (booklet) with details on counting and checking traffic, and the QN signals used by nets.

Speaking of Service by Nets. Modest reports from VO6X and VO6N refer to the Labrador Net as meeting nightly for over two years, 3780-ke. voice work, regardless of summer or QRM or conditions. VO6N spends about two hours two nights out of three as NCS. "The net serves isolated points on the coast of Labrador. Hardly a week goes by without one or two urgent medical requests being relayed from the local RCAF Hospital or the Northwest River Hospital. The requests at times are vital in saving lives; we also handle traffic concerning evacuations of serious cases, cover frequencies in cases of lost persons or aircraft. Such happen fairly commonly here in the north. Most of us are low power and battery operated. May I say we receive a great deal of co-operation from the general public as well as the military and civilian authorities involved."

'55 Program. Have fun in the Sweepstakes? General operating activities will continue at high pitch this month. The New Year will be marked

by a very full ARRL activity schedule as may be confirmed by a quick glance at the Activities Calendar. December offers a last chance to get those improvements in the operating arrangement, where you have been putting them off. Are you all set for operating with full fast break-in, the receiving set-up the best for maximum signals and noise ratio and general efficiency, impedances matched for top power transfer and 1:1 s.w.r? It's not too late to fix a rig for h.f. (if you have been on v.h.f. only) or a v.h.f. rig (for the v.h.f. SS Jan. 8th-9th) if up to now you have only experienced the low end of our spectrum! All Novices should get our free log form to be ready for Jan. 8th-23rd operation in the Novice Round-up, rules elsewhere in this issue. The DX-minded gang according to reports is already putting up new beams and kw. finals for the annual DX contesting time coming up in February. The story is the same; with the good midwinter conditions activities will come so hot and fast after the turn of the year you can't make them all unless the technical matters are finished now in December!

RTTY. The RTTY Society of Southern California held its second annual RTTY Sweepstakes, October 30th (9 P.M. EST) to Nov. 1st (3 A.M. EST). VE3GL reports working F7BM quite often. KA2WW and others overseas are getting operational according to reports. The East Coast RTTY Net meets each Wednesday 3620 ke. at 7 P.M. EST. W3PYW then clears with W9TCJ. NCS of RTNET Midwest meeting at a later hour. RTNET So. Cal. meets Tuesdays 8 P.M. PST on 147.85 Mc. with W6AEE having liaison through 7140 ke. schedules to the first mentioned groups.

Region I, Civil Defense Test. Federal Civil Defense Administration Headquarters has just written ARRL of tentative plans for a civil-defense test of stand-by radio planned tentatively for February, 1955. Plans call for a careful survey of the amateur facilities in the whole Region I area (New York, New Jersey, and New England). Results and conclusions should be applicable to all parts of the nation.

FCDA in asking the assistance and coöperation of ARRL in these plans has in view the maximum development of radio stand-by facilities and their integration at state and local levels . . . and expansion, testing and recruiting efforts looking to February. All ECs and SECs in Region I have been notified. Your monthly reports to ARRL as well as the special questionnaire put out on this test will indicate what this whole ARRL leader-

ship crew can accomplish, working toward a definite objective over the all-too-short period from now to February!

Throughout the nation FCDA is asking fullest participation of both the Amateur Radio Emergency Corps and every RACES group and the expediting of Radio Amateur Civil Emergency Service plans in all states and communities. *Monthly reports* by each EC and Radio Officer should cover training activities, radio drills, new members brought into groups, extension of plans and the like. When consolidated by the NEC these constitute the regional and national picture. It is essential we have these data so we at ARRL may be able accurately to convey to FCDA, FCC and others interested, the true public service potential as represented in our operational facilities.

We appeal to every EC and SEC to start a build-up. Be ready to meet any call or emergency requiring your communications. This will be directly preparatory to the over-all nationwide civil defense exercise (of which the February Region I test is a dry run) looking to about May, 1955!

A question to the *individual* amateur: Are you registered in the AREC or identified with a RACES group?

— F. E. H.

ARRL ACTIVITIES CALENDAR

Dec. 4th: CP Qualifying Run — W6OWP
Dec. 16th: CP Qualifying Run — WIAW
Jan. 7th: CP Qualifying Run — W6OWP
Jan. 8th-9th: V.H.F. Sweepstakes
Jan. 8th-23rd: Novice Round-up
Jan. 14th: CP Qualifying Run — WIAW
Jan. 15th-16th: CD QSO Party (c.w.)
Jan. 22nd-23rd: CD QSO Party (phone)
Feb. 5th: CP Qualifying Run — W6OWP
Feb. 8th: Frequency Measuring Test
Feb. 11th-13th: DX Competition (phone)
Feb. 14th: CP Qualifying Run — WIAW
Feb. 25th-27th: DX Competition (c.w.)
Mar. 5th: CP Qualifying Run — W6OWP
Mar. 11th-13th: DX Competition (phone)
Mar. 15th: CP Qualifying Run — WIAW
Mar. 25th-27th: DX Competition (c.w.)
Apr. 1st: CP Qualifying Run — W6OWP
Apr. 13th: CP Qualifying Run — WIAW
Apr. 16th-17th: CD QSO Party (c.w.)
Apr. 23rd-24th: CD QSO Party (phone)

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is

advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the _____
_____ ARRL Section of the _____
Division, hereby nominate _____
as candidate for Section Communications Manager for this
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon*	Dec. 15, 1954	W. R. Williamson	Mar. 17, 1949
West Indies	Dec. 15, 1954	William Werner	Aug. 15, 1952
Utah	Dec. 15, 1954	Floyd L. Hinchshaw	Feb. 18, 1954
Nebraska	Dec. 15, 1954	Floyd B. Campbell	Aug. 15, 1954
Saskatchewan*	Dec. 15, 1954	Harold R. Horn	Dec. 15, 1954
Colorado	Dec. 15, 1954	Karl Bruggeman	Feb. 16, 1955
Sacramento	Dec. 15, 1954	Harold L. Lucero	Feb. 16, 1955
Valley	Dec. 15, 1954	Fabian T. McAllister	Feb. 17, 1955
Michigan	Dec. 15, 1954	Charles M. Bove	Feb. 17, 1955
Minnesota	Dec. 15, 1954	C. L. Arundale	Mar. 1, 1955
Missouri	Dec. 15, 1954	John M. Carroll	Mar. 1, 1955
Oregon	Dec. 15, 1954	Leonard E. Cuff	Mar. 2, 1955
Manitoba*	Dec. 15, 1954	Dr. A. R. Cortese	Mar. 3, 1955
Mississippi	Dec. 15, 1954	Peter McIntyre	Mar. 13, 1955
British Columbia*	Jan. 14, 1955	R. M. Heck	Mar. 17, 1955
Western	Jan. 14, 1955	Arthur W. Plummer	Mar. 21, 1955
Pennsylvania	Jan. 14, 1955	Howard C. Bellman	Apr. 12, 1955
Md.-Del.-D.C.	Jan. 14, 1955	Vincent J. Haggerty	Apr. 12, 1955
Los Angeles	Feb. 15, 1955	Bernard Seaton	Apr. 16, 1955
Santa Barbara	Feb. 15, 1955	Dr. Charles Fermaglich	Apr. 29, 1955
Maine	Feb. 15, 1955	G. Merton Sayre	May 4, 1955
Southern	Feb. 15, 1955	Reno W. Goetsch	May 12, 1955
Texas	Mar. 15, 1955	Owen G. Mahaffey, W5FMF	Oct. 15, 1954
New Mexico	Mar. 15, 1955		
Wisconsin	Mar. 15, 1955		

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Arkansas Owen G. Mahaffey, W5FMF Oct. 15, 1954

In the Kansas Section of the Midwest Division, Mr. Earl N. Johnston, W0ICV, Mr. Roy T. Harmon, W0IUB, and Mr. Walter L. Bennett, W0WMH, were nominated. Mr. Johnston received 190 votes, Mr. Harmon received 67 votes, and Mr. Bennett received 57 votes. Mr. Johnston's term of office began Oct. 29, 1954.

WIAW OPERATING NOTE

A detailed schedule of WIAW operations appeared on page 77 of November QST. See that issue for full information on when and where to look for the ARRL Headquarters station.

SEPTEMBER FMT RESULTS

In the September ARRL Frequency Measuring Test, open to both ARRL Official Observers and other amateurs, entries were received from 147 participants who reported 541 measurements; 72 entries were submitted by Observers and 75 by non-OO entrants. Each entrant has received an individual report comparing the accuracy of his measurements of the special WIAW FMT transmissions with those made during the test by a professional frequency-measuring laboratory.

The standings of leaders in the test are given below. Decimal fractions are shown only to establish an order of listing, since the official readings can only be accredited to 0.4 parts per million. W4JUI, W2OUT, W8HB, W8CUJ and W8YCP were all within this 0.4 p.p.m. range of accuracy of the laboratory-umpire, and all therefore share top honors equally. In accordance with the announced rules, no entry consisting of a single measurement was considered eligible in the competition.

Observer	Parts/Million	Observer	Parts/Million
W4JUI	0.0	W2OUT	0.0
W1MUN	0.5	W8HB	0.0
W2FE	1.6	W8CUJ	0.3
W9PBJ	3.3	W8YCP	0.4
W1RLQ	3.5	W8CQ	1.3
W2AIQ	5.2	W5TVG	2.3
W8WAV	5.3	W9LZP	2.4
W5QHK	5.7	W2IWH	3.3
W2LS	6.5	W4ANK	3.3
W6ZUX	8.5	W4MB	3.4
W6RW	8.7	W6LY	3.7
W8CZ	9.0	W1QGO	4.4
KP1DV	9.8	W5KQD	4.9
W9RZS	10.7	W4TL	5.0
W3TFN	11.2	W4QN	5.4

The following ratings are based on a single measurement: OOs — W6DVI 2.3, W5QYZ 4.8, W1PXH 11.0. NON-OOs — W6AXV 2.5.

OPERATION ALERT

The nation-wide test of civil defense preparedness sponsored by the Federal Civil Defense Administration and conducted at federal, state and local levels in the U. S., its possessions and Canada, was not just a test of RACES (amateur) facilities, or even just of communications facilities. It affected every civil defense service. We amateurs took our place in the line-up along with all other civil defense volunteers, and the performance we turned in as amateurs did us considerable credit, as c.d. administrators throughout the country have recognized.

Prior to the test, way back last April, ARRL dispatched a bulletin to its ECs announcing the coming of Operation Alert and requesting all to get ready to participate to whatever extent possible. Some 381 ECs replied, 343 of whom indicated their intention to participate in the test, 38 saying they could not participate for one reason or another. After the test we received 189 reports of participation by 2568 amateurs operating over 1700 stations of which 857 were fixed, 126 portable, 738 mobile and 63 hand-carried. Sixty ECs reported participating under RACES, the others in AREC status in support of their local civil defense organiza-

tions. Along with these statistical data were volumes of detailed information on the test, probably of more significance than the data themselves. Browse with us a bit while we summarize some of the reports.

In Alberta, participating stations were divided into two groups: Key Stations in the larger cities, such as Edmonton (VE6HM), Grande Prairie (VE6RF and VE6FH), Calgary (VE6OD), Lethbridge (VE6PV and VE6EQ), and Medicine Hat (VE6JJ, VE6NA and VE6OE); and Stand-by Stations in the smaller communities of Camrose (VE6FF), Cowley (VE6YM), Olds (VE6YD) and Hines Creek (VE6OC), these latter to maintain radio silence until or unless called upon. VE6MJ assumed his station as C.D. Radio Officer for Edmonton at 1800, June 14th, and the Alberta Net was opened at 1900 MST. Although there was little traffic passed, civil defense officials were very much aware of the existence of the amateur net.

Although it at first appeared that Allegheny County (greater Pittsburgh), Penna., would take no formal part in Operation Alert, the gang out there suddenly came to life under the prodding of EC W3LMM. Sixty-two amateurs operated 47 stations, including 33 mobiles and two hand-carried units. The county set-up provides for a main control and five zone controls. Local amateur radio clubs have taken over responsibility for operation of four of the five zone controls, an individual (W3QJJ) operating the fifth. The clubs are the Amateur Transmitters Assn. of Western Penna., Steel City Radio Club, South Hills Brasspounders and Modulators, and the Mon-Yough Radio Club of McKeesport. Operation was on 10 meters with the band wide open, and very successful, proving that operation can be conducted under such conditions. Separation of main control frequency from zone control frequencies by at least 900 kc. provided for continuous monitoring, even when main was transmitting. Allegheny County civil defense communications has recently fortified its amateurs with \$25,000 worth of equipment. Sorry, no room to name all participants, but W3LMM says one Novice participated very successfully and he has a place for any Novice in the RACES set-up.

The Birmingham (Ala.) Mobile Emergency Net established two fixed control stations and conducted its operation on the 10-meter band. The City Hall NCS opened at 0938 CST and zone controls were then called into operation in succession. The simulated attack occurred at 1111 CST, at which time each zone control transmitted two messages to the Jefferson County c.d. director, reporting fires, damages, casualties and injuries. Messages were received in reply at zone headquarters by 1210, at which time telephonic communication was assumed to have been reestablished. A network was also active on 3955 kc., with its control at the same place, consisting of some 35 stations throughout the state and relaying traffic to national headquarters; it was reported that Birmingham was one of the first five cities to report to national headquarters. The state headquarters contact was with W4EW in Montgomery. The NCS on this frequency also secured at 1210. A total of 17 amateurs, all members of the Birmingham Amateur Radio Club, participated in the exercise with 15 mobile units available.

W7DSS reports that the Great Falls, Mont., gang was on deck, although there is no RACES there at present. Through the facilities of W7PCZ, traffic was handled from the State c.d. Director to the local director. Mobiles and other fixed stations were standing by in case they were needed. The local c.d. director phoned W7DSS to say he

This trailer was the alternate Control Station for Norfolk during Operation Alert. Built by and for the Cavalier Amateur Emergency Radio Assn., it has been a major personal project of Norfolk EC W4NV for several years. Shown in the picture, left to right, are W1s HPC, LCW, TEL, NV, YJR and VVP. (Photo by W4NV)



QST for

was pleased to note that the amateurs were on hand and ready to go except for getting RACES authorization.

Approximately 40 amateurs turned out in Norfolk, which was struck by a simulated atom bomb in the downtown area at 1004. The headquarters station was manned by W4 IPA OXG PAK OM DHZ RDI and WZS. The alternate control station, the mobile communication trailer of the Cavalier Amateur Radio Assn. (W4WNZ), was set up in the suburbs and manned by EC W4NV, W4s YJR LCW TEL VVP and HPC. On several occasions the control of mobiles was passed to the trailer, operation of which proved very successful. Across the harbor in Hampton, amateurs were active under EC W4AJA, in contact with Richmond, Norfolk, and other state points as well as with each other.

SEC W7IWU sends in a report from Idaho. The Boise gang drilled on 29.5 and 145.44 Mc., but the former was badly QRM'd by short skip. Two meters worked out best for local communication. Statewide, the QRM on 3995 and 1995 kc. made operation all but impossible, says W7IWU.

W5MU reports for the North Little Rock, Ark., gang, which operated in full cooperation with the Little Rock AREC. He used his own station as NCS on 28,852 kc. A lower-powered rig was set up on 3885 kc. for transferring traffic from the 10-meter mobiles and fixed stations to the state control station in Little Rock. Excellent coverage of the entire area was available on 10 meters, and the net maintained excellent discipline.

Although civil defense authorities in the city of Louisville said no drill was needed and that no part would be taken in the national test, W4MFI reports that the Louisville AREC operated in coordination with the Third Mobile Support Group of Kentucky Civil Defense, the Louisville Chapter of the American Red Cross, Ky. Milit.ry District, State Highway Dept., Ky. State Police, CAA, the airlines and Fort Knox. Net control was W4RCC at the Red Cross in Louisville. Total traffic, about 500, with over 25 amateurs participating in the operation.

In Maine, amateurs were called upon to establish communication between state and county control centers. In addition, many counties used amateur radio for intracounty purposes, especially available portables and mobiles. SEC W1BYK reports a total of over 70 amateurs participating. The state network operated on 3961 kc. starting at 1020 on the 14th and ending at 1115 on the 15th. W1FRS was NCS at the State C.D. Control Center.

W1AVY and his gang were active in the New Bedford, Mass., area. Operation started at 0850 June 14th from control station W1WKM, operated by W1WGN, with W1AVY as stand-by station. The drill was conducted in an orderly fashion on ten meters, with neighboring towns also taking part. Contacts were 100 per cent throughout, with most stations observing strict radio silence unless needed.

At 2000 on June 14th, Pennsylvania's Ogonts Center activated its radio circuits comprising all the counties in the Eastern Area of Pennsylvania. Telephone lines were used to link the Center with the net control stations: W3BIP for c.w. and W3UKF for 'phone. Thirteen counties reported into the 'phone net and three into the c.w. net. Some 38 messages were handled, and radio circuits were secured at 2200. Radio Officer W3FBF held a critique after the test to pinpoint some of the shaky spots, but in general the test went off very well.

In Philadelphia itself, EC W3DYL of the county's Amateur Radio Division put the extensive and energetic Philadelphia gang through its paces. The yellow alert at 0930 found all five county control centers in operation. The mobile communications unit operated from a central location with W3WXC at the controls. Mayor Clark took part in the exercise, and at one point talked from one of the control centers to the mobile control unit, known as Trunk No. 500. That evening between 1900 and 2130 a drill of mobile facilities was conducted. Seven of Philadelphia's main "gateways" were covered by mobiles to report to responsible control centers, using ten meters. All of Philadelphia's c.d. officials agreed that the exercise was the most successful yet conducted in this city.

Tennessee State Radio Officer, W4AEE (formerly SEC) sent in a very complete report of Tennessee activities during the drill, via the present SEC, W4RRV. Since the state RACES network had not yet been organized, general amateur participation was requested through SEC W4RRV. In Memphis, the approved RACES plan went into operation, working into the state civil defense net from their control center station, W4EM. Although there was no

organized amateur plan in Chattanooga, W4IIB arranged to provide communication from that city to state control. Memphis and Chattanooga were "bombed" as a part of the state exercise. The state NCS, W4DDF, opened up on 3993 kc. at 0800 the 14th. After checking with Georgia net control W4ZOC, it was agreed that the latter would move to 3996, with Tennessee moving to 3992. Later, as the QRM became worse in the 10-kc. RACES segment, all stations in the Tennessee net changed to 3980 kc., which was used from then on. Some 69 formal messages were originated, 25 received. Operation was completed at 0429 on June 15th. Over 60 stations were in the state net, representing all major cities and/or relaying when reception became difficult. The usual transmission and equipment difficulties prevailed, but the test was termed eminently successful by all concerned.

These are but a few of the more outstanding of the reports received — mainly those who gave us some details additional to (or instead of) the information on the card, Operation Alert, if it did nothing else, very strongly indicated to civil defense officials at all levels, throughout the United States and Canada, that amateurs are actively working in this thing, preparing to do a big job for their country in the event of need.

The following is a list of all the ECs who reported — hope we haven't missed anyone:

W1a ADW ALP AVY FB BDV BNO BXU BYK CQN CUH EFW FRL IBE IPZ JSM KEZ LKP MCR MD MEG MHE NFG OAX PJ RM RMT RNA RPX SIX SKN SPF VIN BYS.

W2a AJF ASY AWE COT FI FMG GNI HO HXG HXP IAG ILI JLI KVQ OZH PYC QGH RQL RZP SNN SVV VEY VKF YOK ZTZ K2s ASQ BUV.

W3a CJF DYL FBF JW LDD LMM OYX RPL RVS SPL UA WEK.

W4a AJA AJT GET HHK HHQ HUW IM IMQ IYI IYT JAR LMT MEM MFI NDE NV PAK PPR PVD PWS PZT RRV RWM SBI TAS TKL UHY.

W5a AAJ ADC AY KYC LEZ LGY MRD MU ROH UWA UXG.

W6a CER CQI EKP HKD IXJ JPU JWD NHP NTN QLR SLX UJ ZRL.

W7a BDL COH DSS IOZ IRX IWU JRU KGF NLL.

W8a AJH APF CPB CZR ERR FCP FUM HNP IVK JNR JWX SFU THU UGE VKC WAB.

W9a AYP BA BSZ EKR GMY HPG IHO LAG MCS RDI UB VIIA WLZ ZSC.

W0a GTX HDX HKF HRY HUI JDJ KQD KZR MXG PGX PNK RCE.

VEa 1EK 2KG 3YJ 4RP 6MJ. K4VBD.

Thanks to the above and the other thousands of amateurs who participated for doing a good job for amateur radio.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,400
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; 'phone — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are generally employed by amateurs using radioteletype throughout the United States.



Emergency Coordinators often have to ask themselves of just what value a test or drill is, considering what would or might happen during an actual emergency, and they have to evaluate to what extent the performance during the drill betters, equals, or falls short of what the performance would be in a real emergency. No easy job, we admit. Let's look at some of the factors.

Assume the EC calls a test drill. About 40 per cent of his members will show up for it, more or less depending on whether it's planned for convenience or as a surprise drill. They'll have an exercise, perhaps in coordination with local c.d. authorities, and afterward a critique to decide among themselves if they did a good job or a lousy one. Quite often they'll kid themselves into thinking it was acceh- high, especially if they get patted on the back by public officials, newspapers, radio stations or what have you — and they'll disband feeling that they're ready for anything. What is often forgotten is that those we serve are very much more prone to compliments than criticism, since, our service being voluntary, to do otherwise would be like looking a gift horse in the mouth. It is necessary for us to decide for ourselves whether or not a good job was done, even though good publicity is of course desirable. Political enonimous are misleading and dangerous — never believe them.

In order to get some idea, then, of what would happen in a real emergency from what happened in a test emergency, we have to consider the following:

- How many who participated would have been unable to participate if the test had not been planned, or accidentally worked out, to suit their convenience?
- How many who did not participate failed to do so for personal reasons which would have been overruled if the emergency had been real?
- To what extent could you figure on "picking up" some operators in a real emergency from local amateurs who never previously took any interest in emergency work?
- What percentage of your operators would you lose to their employers or other obligations during a real emergency?
- How would each of the above factors influence equipment availabilities, presuming most of the equipment is owned by individuals?
- Considering that a real emergency might happen at any time of the day or night, what are the minimum and optimum times so far as your own personnel are concerned, and how do these compare with the time your test was held?
- How about the time of year? A test held during the winter months may produce entirely different results from one held during the summer.

These and other things must be considered in evaluating your AREC tests and drills. Don't be misled into thinking that you're better off than you are, emergencywise.

On August 20th the Great Falls (Mont.) AREC (see p. 66, Aug. '54 QST again) provided communications during a military aircraft accident, eight miles west of Great Falls.

Providing communications from the accident scene were W7PCZ/M and W7VPY/M. On the other end were K7FCC and W7KUH/M. K7FCC relayed information to Great Falls Air Base authorities and W7KUH provided communication between the crash scene and the CAA control tower. Also assisting was W7DXK/M who directed traffic near the accident scene until military police arrived.

— W7KUH, SEC Montana

On Friday, Sept. 10th, W7NOM was at the Hart Mt. (Ore.) game refuge for some archery hunting when a large range fire was reported out of control and threatening the refuge headquarters. There was no means of communication with the Forest Service in Lakeview, about 50 miles away, so a call was made on the Oregon Emergency Net frequency (3840 kc.) and W7QEI and W7SBS were contacted. QEI relayed to SBS who called the department and requested equipment be sent to the area. W7s QKU SD and FNZ were also there helping. In due time the equipment arrived and the fire put under control — thanks to OEN.

— W7NOM

Even while the SET was being energetically worked by Indiana amateurs on October 9th-10th, the stage was being set for two catastrophic strikes that took "simulated" out of the picture and injected realism into the operations of the section emergency facilities. During Saturday night heavy rains poured onto northern Indiana and Illinois, causing flood conditions at Plymouth and other northern Indiana communities not unlike those encountered in Chicago at the same time. Then on Monday, October 11th, a tornado struck into the vitals of Franklin, Indiana, destroying thirty homes and injuring several persons.

EC W9AYP headed the group handling the Plymouth flood communications problem. Assisting him were W9GAD and W9JWI, all working mobile with stations in near-by South Bend, where EC W9UBA headed an active group. EC W9KMN organized a group of mobiles to cover the Franklin tornado scene. They included W9s ALQ UGH and ZTN.

The Indiana Fone Net was called into session to handle the emergency with W9EQO as NCS. Stations assisting included W9s CDU CMT NTA ILU FWS EDE FYM AB CC MAM ZIB FUS, W2BQM and many others.

— W9LZI, SEC Indiana

On Sunday evening, July 25th, the Sheriff's Department of Broward County, Fla., called Eastern Florida SEC W4IM requesting contact be made with one Leo Yob, W8KYY, who was operating mobile somewhere in Florida and advise him to call home due to an emergency. The Broward Emergency Net was immediately alerted for local coverage. Early Monday, July 26th, W4IM originated a message addressed to W8KYY/M which was passed to W4DRD for placement on the Florida Phone Traffic Net on 3945 kc.

It was ten-meter skip that finally did the job, however. One of the mobiles of the Broward Emergency Net contacted W1LGE on 29,400 kc. and just on chance suggested he give W8KYY/M a call, after explaining the circumstances. In this way the contact was made and W8KYY was notified of the emergency from Florida via relay through Connecticut while he was traveling in Georgia.

— W4IM, SEC Eastern Florida

On June 13, 1954, six members of the Sidney (N. Y.) Amateur Radio Club provided communications for the out-board motorboat marathon starting at Alexandria Bay, past Clayton to Cape Vincent and return to Alexandria Bay, a round trip of about 60 miles. The six mobiles involved, operating on 29.6 Mc., were W2s GFD UPT JGJ MTB RZP and K2CVX. W2GFD and W2RZP set up a 40-watt station

Dodge Division of Chrysler Corporation recently donated a Dodge Route-Van truck to the Inter County Amateur Radio Club, W8GIS, for use of the Detroit area AREC in emergencies. The mobile unit is equipped with a generator and three complete operating positions, including a 2-meter RTTY unit. Most of the radio equipment was donated by Elmac. In the picture, Dodge officials are thanked by radio by Assistant EC W8LSQ. That's W8CYL standing behind the van, and Detroit CD Communications Coordinator Al Thomas second from right.



QST for

on the dock at Alexandria Bay. W2JGJ operated at Clayton, K2CVX at Cape Vincent, with W2UPT and W2MTB operating at mid-point. A 110-volt gasoline-driven generator was kept on stand-by at the Alexandria Bay station. Operation lasted from approximately 1300 to 1700 EDT. Approximately 60 boats started and were officially checked off at Clayton and Cape Vincent. These check-off returns were transmitted back to the starting point in order for the boats to qualify. The boys managed to get the results in despite weak signals and high ignition QRN.

—W2RZP

On Sunday, August 29th, the Atlanta Motorcycle Club held an endurance run from Mirror Lake to Alatoona Lake, a distance of about 75 miles. Amateur mobile units provided communications at various check points along the route. Mobile stations participating were W4s TJ8 RVH YFR NS IPL WRV PUM and MQN. Fixed stations who helped relay were W4s WYP LYG PMJ UHH KXT UMM and YEK. Several weak points were discovered in the emergency set-up and will be corrected by the time we have another drill or a real emergency.

—W4OPE, SEC Georgia

Thirteen SEC reports hit the NEC desk reporting August activities, on behalf of 3229 AREC members. This represents an increase of one report over last year, and a slight increase of AREC members is represented. However, it's a decrease of three from August, 1952.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made on December 16th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,900 kc. The next qualifying run from W6OWP only will be transmitted on December 4th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from WIAW each evening at 2130 EST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of QST text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in step with WIAW.

Date Subject of Practice Text from October QST

- Dec. 2nd: "It Seems to Us . . .", p. 9
- Dec. 6th: An R.F. Assembly for Mobile. . . , p. 11
- Dec. 9th: A Step-by-Step Transmitter for the V.H.F. Man, p. 16
- Dec. 13th: The "Simple Squirt" Beam, p. 20
- Dec. 15th: Some Principles of Radiotelephony, p. 22
- Dec. 21st: An Improved Volume-Compression Circuit, p. 25
- Dec. 23rd: Re the "Tubeless VFO," p. 30
- Dec. 27th: A Protective Circuit for Transmitting Tetrodes, p. 33
- Dec. 30th: Bandspreading the Clapp VFO, p. 37

A.R.R.L. — AFFILIATED CLUB HONOR ROLL

It is with great pleasure that we here present the second section of our Honor Roll listings for 1954 in accordance with the Board policy for special recognition of all affiliated clubs whose entire membership consists of members of the League. Refer to page 69 of June QST for the earlier listing of additional active clubs with 100 per cent ARRL membership. Our honor list is based each time on analysis of data received in the '54 Annual Information Survey conducted to meet Board requirements. In early '55 a new form will be

sent each active affiliate for the filings on which continued affiliation and new Honor Roll listings will be based. Very many clubs will now be engaged in mid-season activities, code and theory classes for newly-interested persons, civil defense, building and technical programs for members. The '55 survey will assist the nationwide compilation of our status and progress besides getting required ARRL information. The following clubs now will receive "100% ARRL Club" certifications following publication of this QST.

The Amateur Radio Transmitting Society of Louisville, Ky.
Athena Amateur Radio Club, Athens, Ga.
Dryden Radio Club, Dryden, Ont., Canada
The 50 Club of California, Inc., South Gate, Calif.
Fulton County Radio Club, Canton, Ill.
Gulf Coast Amateur Radio Club, Inc., Hantsboro, Miss.
Helix Amateur Radio Club, San Diego, Calif.
Jacksonville Amateur Radio Society, Jacksonville, Fla.
Lower Columbia Amateur Radio Association, Longview, Wash.

Maui Amateur Radio Club, Maui, T.H.
Muskingum Amateur Radio Association, Zanesville, Ohio
Norfolk County Radio Association, East Walpole, Mass.
North Montana Radio Club, Montana
Palomar Radio Club, Escondido, Calif.
Reading Radio Club, Reading, Pa.
Rock River Radio Club, Dixon, Ill.
Southern Pacific Amateur Radio Klub, Eugene, Ore.
Valley Radio Club of Eugene, Ore.
Western Slope Radio Club, Grand Junction, Colo.

TRAFFIC TOPICS

The way one becomes accustomed to doing things is a very powerful influence in determining the way he wants to do things. This principle applies very strongly in handling traffic as well as in all other phases of amateur operating. Habit born of custom is probably the principal deterrent to adoption of standard operating practices. And when these non standard habits are spread, through personal influence, among newcomers to the game, we tend in the direction of make-it-up-as-you-go procedure, making our traffic handling that much more difficult.

Throughout many, many years, ARRL has been called upon to set the standards for procedure in handling traffic, and has endeavored to do so in as much detail as practicable. Yet, it has very seldom been possible to adopt the procedure preferred by the majority, because usually there is no such thing. We have tried to adopt procedure that is both logical and utilitarian to the maximum degree, and we have tried to make this the standard among amateurs, usually with success; sometimes it just hasn't taken hold.

We are a bunch of philosophers and stoics about such things, but at the same time want to point out to you the desirability of an amateur standard in traffic handling procedure, as outlined in the booklet Operating an Amateur Radio Station. The writer of this column personally does not agree that all the standards set up are the best. You will not agree, either, with all of them, in all probability. Yet that in itself is no reason to change them. Whether you or I agree with them or not, if we are to achieve an amateur standard we should follow them to the letter, squawking as we do so if it makes us feel better, until or unless the majority seems to prefer to do it some other way. Then we'll change the standard, and the squawking will then be on the part of the minority who liked the old way of doing 'c. Yes, there will always be someone dissatisfied. *C'est la vie.*

The type of person most to be admired, in our estimation, is the one who disagrees but goes along in the hope that he can correct or change those with whom he disagrees. It is easy (and natural) to pick up your marbles and play by yourself, and most of us, in the pursuit of our "hobby," follow the easiest and most natural path. But real progress is made by those who follow their natural instincts only after they have rationalized them.

W0BVL and W8AMH report that the Early Bird Net had a traffic count of 759 messages during the month of September.

National Traffic System. We believe we have not yet chronicled changes in several NTS managements. In the Sixth Regional Net, W6JOH took over from W6IPW some time ago, and VE3GI is the successor to VE3BUR on TRN;



One of the more prominent traffic stations heard daily on the forty-meter band is W3CVE, Conan W. "Red" Barger, manager of the Transcontinental Relay Net. Red is working out an agreement with the USO for handling servicemen's traffic, and is shown here with the local USO Director at the W3CVE operating position. (Reni Photos)

Walt has had a long and successful managership career in a tough net to handle, and he is remaining with the net but turning the reins over to Burt. In the Seventh Region, W7KZ has resigned but continues to act until the Pacific Area Staff recommends his successor — probably an accomplished fact by the time you read this. In the Fifth Region, W5KRX has resigned owing to the pressure of business, and a successor is being named forthwith. So the NTS turnover continues, and that about brings us up to date as of the middle of October.

September reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
EAN	22	655	1.20	29.6	94.7
CAN	21	519	—	24.7	100.0
PAN	21	600	—	28.5	95.2
1RN	22	291	0.46	13.2	87.0
2RN	36	183	0.30	5.3	79.6
3RN	22	219	0.40	10.0	95.5
4RN	48	177	0.76	4.0	30.6
RN5	27	260	—	9.6	60.2
RN6	44	283	—	6.4	—
RN7	50	442	—	8.8	31.8
8RN	20	182	—	9.0	91.7
9RN	40	349	0.47	8.7	—
TEN	70	1658	—	23.6	60.7
TRN	24	64	0.33	2.6	47.2
Section*	340	2033	—	6.0	—

Summary	737	7915	EAN	10.7	CAN
Record	737	7915	—	15.4 ('53)	—

Late Report:

RN5 (Aug.)	26	182	—	7.0	46.2
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*Section nets reporting: AENB and AENP (Ala.), QKS and QKS-SN (Kans.), Nebr. C.W., Tenn. Sec. and Tenn. Hi-Speed, WVN (W. Va.), Minn. 'Phone (Noon & Evening), WSN (Wash.), No. Calif. Net, So. Calif. Net; CN (Conn.).

W7NH resumes control of PAN for the winter season; W6UTV was Acting Manager for the summer. W2LPJ reports starting early session of 2RN, but not much activity so far. W3ONB has congratulated MDD for having had someone on 3RN for seven consecutive months without a miss — 171 consecutive sessions. W7TGO has qualified for and has been awarded an RN7 NTS certificate. W8DSX says 8RN needs more help from Michigan and West Virginia; one station is carrying almost all the load in each

of those states. W9UNJ reports that 9RN has been expanded to operate six days per week, and representation is improving, with Indiana showing signs of renewed life. W4KKW has done an excellent job of rejuvenating representation from Kentucky; what they need now is more traffic.

The Transcontinental Corps is also taking on new life, now that a new traffic season is under way. W6HC has taken over the Pacific Area TCC Directorship in order to give W6JZ more time for his ARRL Directorship, and reorganization is under way. W8UPB has almost all vacancies filled in the Eastern Area, but if you're available don't let that keep you from asking him. W9JUI reports Central Area TCC getting reorganized. The new roster includes new calls K9FCA and W8BDR. Most of the Central Area stations are reporting directly into PAN, but hope soon to be lined up with Pacific Area TCC stations. W8SCA doing a stellar job.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for September traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUTL	201	2193	1456	628	4478
W0TQD	8	1053	1036	19	2118
W0HIDR	17	865	842	11	1735
W3WICQ	38	804	798	65	1705
W9JUI	36	672	609	35	1352
W4PL	7	647	572	48	1274
W0SCA	6	630	544	79	1259
W2JOA	32	589	523	40	1184
W70A	15	569	547	20	1151
W2KRV	25	440	402	38	905
W9DQ	40	408	70	378	896
W6SWP	31	435	385	38	889
W6PHI	34	463	267	105	869
W9NZZ	247	305	1	302	855
W5MNC	25	404	299	116	844
W7PGY	181	406	235	22	844
W4OGG	10	370	329	35	744
K6FCY	29	353	311	42	735
W4DVR	627	29	42	5	703
W5TFR	31	322	296	26	675
W2KEB	24	319	234	77	654
W6QMO	38	310	243	60	651
W2HO	5	299	303	5	612
W8CPI	4	300	281	19	604
W6QXO	16	293	197	93	599
W9VBZ	88	255	226	29	598
K2DXX	11	285	271	12	579
W6YDK	18	269	223	64	574
W2LPJ	10	276	246	40	572
W8ELW	15	279	261	17	572
W8FEN	3	278	274	77	566
W6LYG	32	256	157	99	544
W9CXY	19	257	209	48	533
W7FRU	2	269	220	40	531
K6FAE	18	246	252	14	530
K2EP	5	251	256	8	520
W9JBQ	147	181	151	36	515
W2JZX	47	241	132	92	512
W6ICG	4	230	248	26	508
W8CAR	7	245	250	2	504
W6ZRJ	34	236	221	9	500

Late Reports:

K2EP (Aug.)	7	325	339	4	675
K6FAE (Aug.)	13	251	233	11	508

More-Than-One-Operator Stations

K6FAA	160	1897	1840	57	3954
W6IAB	91	1586	1483	103	3263
KA2UUA	55	1567	1576	38	3226
K0AIR	38	869	817	50	1774
K0FDX	55	785	763	22	1625
K6FDG	90	638	588	38	1354
KA2AK	495	391	264	32	1182
K7FDB	15	374	323	9	721
K9FCA	80	276	325	24	705
W6BL	31	308	294	14	647
W1AVY	33	288	12	276	609
K4WAR	116	159	221	30	526
K6CST	16	245	242	7	510

BPL for 100 or more originations-plus deliveries:

K2FAV	231	W3CVE	128	W6CMN	101
V06N	174	W1LYL	123	KA7JM	100
KA2HQ	173	VE3NG	122	Late Report:	
W6FQB	168	W4DRD	109	W3WV (Aug.)	100
K2CHD/1	164	W0KQD	107		

More-Than-One-Operator Stations

KA2GE	254	K4FCU	153	W1WKM	100
KASAB	185	VE1FQ	152		

The BPL is open to all amateurs in the United States, Canada, Cuba, and U.S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 18 hours of receipt, in standard ARRL form.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — W. H. Wiand, W3BIP — SEC: IGW, RM: AXA, PAM: PYF, E. Pa. Nets: 3610, 3850 kc. With this, the last report of 1954, is a complete run-down of official appointees of Eastern Pennsylvania. OBS: BES, NNV, QGL, TEJ, UCV, OES, ELI, NNV, UGA, UQL, OO: ALB, ASW, KFK, MLY, OCG, PDJ, QAG, QZP, SQW, UUA, TFN, VDE, VR, OPS: PFC, MAC, MWL, NNV, PYF, QOR, RSC, VDE, ORS: AD, ADE, AXA, BFF, CDT, CHU, CUL, DUL, EAN, ELI, EU, JNQ, NOK, OML, OZY, PDJ, PVY, QIZ, QV, UOE. The Abington ARC of Thorop, Pa., and the North Penn ARC are now ARRL affiliates, bringing the total affiliated clubs to 25 in Eastern Pennsylvania. All clubs are invited to report club doings and activities monthly to this office. A five-car caravan bearing twenty members of the Northeast ARC motored to ARRL Headquarters Sept. 26th, where George Hart, INJMI, conducted a tour of WIAW, the amateur radio museum, the experimental laboratory, and the editorial offices. DYL reports all had a wonderful time in spite of the heavy week-end traffic. DVB's 10-year-old son received his Novice ticket in July and won a prize for being the youngest licensed ham at the South Jersey Hamfest. Another youngster, 12-year-old Dale, VNJ, is the youngest member of PFN. VKW, a high school student of Hamburg, is NCS for AN every Fri. and also is active on PFN. DUL reports four more new Novices, WN3s ZMZ, ZOZ, ZQA, and ZQB. FXK's XYL advanced from Novice to General Class with the call YLY. A new Novice in the Potomac Area is ZVY. FPC is looking for more after-midnight 10-meter activity. EAN, while in QSO with PY4FH, made a tape recording of a former Philadelphia woman now in South America and played it to her folks in lieu of a 'phone patch. PYF reports OK is back on the air and now a member of the PFN. The old-timers will remember OK back in the days of the AARS, and even before that Ed was turning in a good traffic total each month. In closing this last report of 1954 yours truly wishes to extend to each and every one a very Merry Christmas and a Happy and Prosperous New Year. Traffic: W3CUL 4478, BFF 319, OZY 170, NOK 120, VNJ 98, AXA 88, PYF 68, UOE 61, TEJ 56, QIZ 53, TTY 51, TYU 41, GUY 37, RXW 33, DUL 21, VKW 20, UWP 18, PVY 11, VGX 9, YJM 8, OK 5, NNT 4, AD 2, BES 2, VPY 2, YAH 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQU — EQK recently received a query from Peter H. Short, 7 Ambush Street, Kensington, Johannesburg, South Africa, who is about to make a decision to move to the United States and would like information, especially on Baltimore, Md. Any Baltimore amateurs who would like to be of help are requested to inform him about house rentals, food prices, schools, medical services, furniture, places of worship, etc. Although he is not a ham, he also is interested in clubs and prices of ham equipment. WV has his 14-Mc. three-element folded dipole beam up again. CVE reports TCRN was on semi-alert from Sept. 5th to 10th and full alert on the 11th for Hurricane Edna with 44 stations participating. CQS visited BAK at Laurel, Del. Oct. 10th. DRD now has 40-ft. steel tower with 14-, 21-, and 28-Mc. beams. During a recent civil defense meeting at Delaware City, Del., Governor Boggs presented Awards of Commendation to the Delaware Amateur Radio Club of Wilmington, the Kent County Amateur Radio Club of Dover, and TCQ of Sussex County. 3PXM/4YQC advises that his new address is A 2c Daniel S. Murph, Jr., AF14510147, Headquarters Squadron Section, AF Missile Test Center, Patrick Air Force Base, Cocoa, Fla. QC'B expects to be back on the air soon with his surplus BC-669-C. MDD opened for traffic on Sept. 7th. A c.d. demonstration was put on in Hagerstown Sept. 9th sponsored by the C. & P. Telephone Co. CIQ and OYN attended. The Antietam Radio Assn. of Hagerstown had its message center in operation again at the Hagerstown Fair Sept.

20-25. Those who gave of their services were EHA, CSX, NZT, OXL, OYN, RAH, TIV, VAM, WTO, WWM, WYH, YRK, 8GPD, Jerry Reeling, and Harry Hager. Traffic was handled through 4BLR and the Old Dominion Net, 4YIA and the Virginia 'Phone Net, 3JZY and the Maryland Emergency 'Phone Net, 3QIQ and the Transcontinental 'Phone Net, the Pennsylvania 'Phone Net, KNFCJ and the Mike-Farad Net, 4PSC, and several others. CSX has traded his HQ-129X for an HQ-140X. Jack Davis, formerly 1X4CZ, and a newcomer to America, now is a resident of Baltimore and recently joined the Baltimore Amateur Radio Club. Reports from Cumberland say that WN3ZWG is just 11 years of age and WN3ZWV, of Cresaptown, is a junior in high school. The Capital Amateur Radio Traffic Club was organized Aug. 29th with a view toward promoting and expediting the handling of amateur radio traffic into and out of the Washington, D. C., Area. The club is affiliated with TCRN. Officers are CVE, pres.; WV, secy-treas.; OHL, trustee. KLA reports high interest in the Sept. V.H.F. Contest. WN3ZQA, WN3AY, W3YQD, MPR, and QQO set up equipment on Spruce Knob, W. Va., and made 32 contacts on 2 meters. YPW was on 2 meters with a converted 522. WN3ZQA is using a ten-element brownie and a 522. RRT will build a 2-meter converter this fall. UKM expects to complete a 2-meter rig by next spring. YQD is active on 222 Mc. with an 832 section-modulated and a sixteen-element horizontal array. The Elkton (Md.) Radio Society's new president is VZZ and vice-president is GGR. The Cecil County (Md.) RACES plan is in the works and 2 meters is planned for the county net frequency. WYA is CDR of Cecil County, while VZZ is Asst. K3WAS, of the MARS station at Aberdeen Proving Ground, holds code and theory classes Tue. and Thurs. at 7:30 p.m. 9DHR and 5TMO have moved into the Aberdeen Area. 5YWA moved to Arlington, Va. 9OKI has a new fixed station aside from his mobile Mercury rig. 38ZY bought an RME converter. LDD expects to be in some 2-meter work along with the Cecil County gang. QZC reports a fine vacation as camp counselor in Connecticut. K2CRG spent a week at the same camp with QZC. CDQ reports a new Viking II and a VFO in her shack. AYS tried the VE/V Contest with 30 wats and wound up with 64 contacts in all VE sections and a score of 17,000! Traffic: (Sept.) W3WV 418, CVE 414, JE 64, CQS 36, NNX 24, PKC 12, QOS 2, (Aug.) W3WV 472, CVE 126, ECP 10, HKS 6, (July) W3DRD 22.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — PAM: W2ZL. The SJRA Hamfest and Picnic held recently was bigger and better than ever, with a greater attendance and a fine planned program. K2AA, the club station, did a swell job of guiding the strangers to the picnic grounds. K2DZL now is mobile on 10 meters. BJA is doing a good job on 10 and 20 meters. BDK is reported on 2 meters. SLG has transmitter trouble and expects to do considerable rebuilding before he is back in business. Bill also has applied for MARS membership. The Burlington County Radio Club station is now completed, operating on 2 and 10 meters. K2ERC was first and K2FB second in the recent C.D. Party. ZQ did a swell job in Operation Alert, handling over 50 lengthy messages. VQR and ZI were the operators. PHN and WI are reported as new calls on 2 meters. The New Jersey Emergency 'Phone Net operates each Sun. at 9 a.m. on 3900 kc. ZQ is net control. HAZ has received his WRE certificate. Congratulations, Bill. NDO is moving to Camden County. K2EWS received his General Class ticket. The New Jersey C.D. Net (c.w.) needs representation in the southern counties. RG is net control on 3505.5 kc. every Sun. at 7 p.m. I would appreciate reports from clubs in the southern counties, especially Cumberland and Atlantic Counties. All nets in the section are urged to hold regular drills so that they will be better able to do a good job in case of an emergency in their communities. Traffic: W2RG 115, ZVW 33, ASG 26, K2BG 23, W2SUG 23, ZI 17, K2CPR 5.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB, SEC: UTH/ FRL, RM: RUF, PAM: GSS, NAL. NY's meets on 3516 kc. at 6:30 p.m., 3925 at 7 p.m.; NYSS on 3505 kc. at 8 p.m.; NY's C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPC 2nd call area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 kc. at 3 p.m. EMA visited LXE, W2-Land was represented at the S. Ont., W.N.Y. v.h.f. group at Oakville, Ont. We regret to announce the passing to Silent Keys of BAG. JPE is mgr. of the Erie Co. Emergency Net, 75-meter section. LXE and SJV attended the SJRA Hamfest at Camden, N. J. TBI won the 2-meter transmitter hunt. GBX is working DX with Viking II on 15 meters. OZR acted as relay station for emergency traffic during Hurricane Carol. RTB and K2CEH are working on 220

Me. UTH worked Rhode Island, Kentucky, and West Virginia on 2 meters for 3 new states. New officers of the Ft. Stanwick ARA are: SWN, pres.; IXR, vice-pres.; HAX, treas.; M8M, secy.; HWS, chief eng. K2s HWS and AQP, with a DL9 as a guest, took the hills for the V.H.F. Party. K2GWP is working out FB with new 20-meter vertical antenna. K2AHH/2 is attending college. New officers of the CARs are: DMC, pres.; EJO, secy.-treas.; K2DPT, vice-pres. D. Hamilton spoke on "A.C. Power" at an Elmira ARA meeting. K2CAB says QHH is the first "W" he worked on 3.5 Mc. QNA reports new officers of the Niagara ARC are LCP, pres.; CMV, vice-pres.; V2E3M, secy.; RVJ, treas. TVO has been appointed EC for Cayuga Co. and Z2G for Montgomery Co. JPE heads a committee to give Novice exams before each RAWNY meeting. VEP, asst. mgr. NYS 'phone net, is leaving for W7-Land. K2CUQ is giving code lessons to a local YL. CXM, Cornell U. station, is becoming active again with a Viking I, SP400-X, 129X, and HFS receivers, 2-meter as well as 420-Mc. gear, off-center-fed antenna for 40 and 80 meters up 100 ft., and three-element 20, four-element 10, 144, 420-Mc. beams up over 110 ft. The Oneida Fest was enjoyed by everyone in attendance, thanks to the excellent arrangements of RXW. RHQ reports that the 32-element 2-meter beam is working better since changing the distance between upper and lower booms. Renewals: CLX as EC for Saratoga Co., PYC as EC for Herkimer Co., ZRC as ORS, BTB as OFS. Appointments: WS as ORS, CZT and UTH as OPS. NYS net certificates were issued to IFV, CKK, Z2G, and K2ACA. Traffic: (Sept.) K21XY 579, W2ZRC 260, QHH 228, K2FAV 231, W2RUF 224, K2BZC 182, DSR 108, W2BNC 103, RUT 31, COU 27, SJV 26, K2CUQ 10, W2GBX 9, CXM 8, RJJ 8, FEB 6, (Aug.) K2DSR 158, W2RQF 11, GBX 9, K2GDI 8, W2QLI 6, DVE 2, (July) W2WS 109.

WESTERN PENNSYLVANIA—SCM, R. M. Heck, W3NCD—SEC: GEG, RMs: UHN, NUG, and GEG. PAMs: AER and LXE. The Western Pennsylvania Traffic Net meets Mon. through Fri. at 7:00 p.m. on 3585 kc. Washington County reports SUK still is operating the v.h.f. IDO is on 40-meter c.w. with the VFO at 60 watts while building an 813 final. USC is on 40-meter c.w. with a TZ-40. KHY is on 20 and 15 meters with a new rig. CRA is getting good DX on 20 meters, the jr. operator at NRE has built a one-tube receiver and is monitoring the 80-meter c.w. and 'phone bands, and NQM is thinking of changing from a.m. to a.b.b. The Radio Club of Erie is sponsoring code and theory classes at the YMCA every Tue. at 7:00 p.m. Classes began Oct. 5th. New Novice calls are ZNZ and XNY. NRI found conditions very good while working aeronautical mobile recently with many contacts locally and over into Ohio. Herb Johnson, formerly QKI, now in Los Angeles with the call W6QKI and his XYL is now K6HOI. Herb still is planning 2 meters to the moon. The c.d. has ordered uniforms for the bama participating in the c.d. exercises. The Mon Valley Amateur Radio Club of Clarion, Pa., a newly-formed club, was host to the Western Pennsylvania Amateur Radio Club Council, which met Sept. 27th in the club house located on the W.S. Steel experimental farm high on the hilltop over the Monongahela River just east of Clarion. Club officers are AOX, pres.; RCQ, vice-pres.; MRZ, secy.; and NBJ, treas. UH is a new OO appointee. All clubs or groups of amateurs are invited to join in the important emergency work of the Amateur Radio Emergency Corps and c.d. For information contact your Section Emergency Coordinator, A. C. Heck, W3GEG, 515 Cedar Ave., Sharon, Pa. Traffic: (Sept.) W3WQI 1705, LMM 216, PQP 160, YA 84, LXQ 48, UHN 34, SJJ 32, TSY 31, KUN 24, UTR 12, NCD 10, NMJ 6, KNQ 4, (Aug.) W3GEG 97, (July) W3GEG 115.

CENTRAL DIVISION

ILLINOIS—SCM, George Schreiber, W9YIX—Nets: ILN, 3515 kc., RMs BUK, MRQ, IEN, 3940 kc., PAM: UQT, SEC: HOA, Cook County EC: HPG. On Sept. 25th LARK started its third year with an installation of officers at a dinner. The new officers are YBC, Gloria, pres.; SYX, Peggy, vice-pres.; YXK, Rita, secy.-treas.; NYC, Gladys, publicity; IKS, Edna, editor, and FMZ, Rosemary, Novice representative. LZ and your SCM spoke, DW and D80 are trying to find the original members of the Ridge Radio League, one of the earlier Chicago Area clubs. Write them. The Society of Radio Operators entertained the XYLs and friends with an outdoor barbecue recently. ILW resigned as EC for Kankakee County because he moved; LCH has been appointed in his place. Other EC appointments are CZB, Winnebago County; KKG, Mason County; and VWJ, Montgomery. Is your county represented? The Chicago Suburban Radio Assn. held its first fall meeting recently with a "get-acquainted again" session. RQY spends a lot of time at OO duties and sends in an imposing report. ILN certificates were issued to VSN and WJQ. RLX has been appointed acting secretary of the Chicago Area Radio Club Council by HPG, the president, and is learning to copy code on a mill. ZRP sure gets around to club meetings and never misses a chance to put in a good word or two for RACES. Why don't you give him a hand and volunteer for service? A new ORS appointee is VTO. OBS appointees this month are SWO and HOS; OOs are EET and GDI. The ILN slow-speed session is really going good at 8:30 CST, 3515 kc.

Give it a try, and brush up on your code speed. Congrats to SME and his XYL on the arrival of Susan. FBP writes an interesting letter from KLT-Land, where everything is DX. AA, who has been a ham for more than 40 years, recently plunged into traffic and enjoys ILN; he sold the BC-610 and puts out a good signal with 807s. DIX got General Class license and plans a mobile installation. NIU got up a 20-meter antenna and now wants someone to tell him where to get the time to use it. JNN is new MARS director at the 5th Army. SKR is working to de-TV a BC-459. BQC is attending Luther College at Decorah, Iowa, and gets on the air with a Viking Ranger. TAL finished a new all-band transmitter, 160 through 10 meters. PDH forecasts the completion of his house soon and then, well, he says, be on the air. Among the student group at the University of Illinois this year are PLH, WFU, and YWU. The Twin City Radio Club, in its bulletin, promises an interesting fall and winter program, from technical talks to stags for the members to Christmas parties for the families. The Starved Rock Radio Club is tickled that QIZ has been elected as Vice-Director. On the sick list are AIO, EVV, and YNE. We wish them all speedy recovery. EU is doing yeoman work for the Illinois license plate bill in the Legislature. TLC burned up a plate supply, but managed to get back on the air. Traffic: W9DO 896, K9FCA 705, W9SME 172, USA 104, YIX 89, CEE 62, W6CWI/9 56, W9BUK 51, MRQ 46, VTO 38, RLX 32, STZ 19, USI 16, LXJ 12, AA 3, JMG 2, BQC 1.

INDIANA—SCM, George H. Graue, W9BKJ—Section Nets: QIN, 3656 kc. Mon. through Sat., 1600, 1830, and 2200 CST. OLX Net Mgr. IEN, daily 0900 and 1830 CST. NTA Net Mgr. RFN, Sun. 0800 CST. WWT Net Mgr. SEC: LZJ, RMs: JUJ, WWT, OIX, and JBQ. PAMs: NTA and CMT. LQE is the most consistent ONS. Total traffic on QIN is 416, on IFN 197. WUH will quit 9RN; TT and UQP for UTL. JP will be in operation at the Hobby Show. N9IMO is new in Warsaw. KLR has worked his 20th state on 2 meters. UTL has a Viking II and VLF. MA has a Viking Ranger wired by ZCG. PAB is visiting WCE and MAM. SNF, MVZ, and AHS are active on 2 meters. EGQ had a Novice visitor. PUB has garnered the last few parts of the new rig. PNE is working DX on 160 meters. IOC is active on 2 meters. EAO now is on 75-meter 'phone. ZVS is new at Elizabeth. N9HRY is on with a Heathkit. N9IRT is new on 3.7 Mc. WWI is rebuilding. URS and his XYL, N9ICL, are on 40 meters. With sorrow I report PZM is among the Silent Keys. QYQ is back home after an operation in Louisville, Ky. hospital. IRCC held its semi-annual meeting at Indiana U. Oct. 24th. EHZ has General Class license after 30 years as a commercial operator. RDJ has off-center antenna. New at Evansville are N9KJD, KEP, GSC, and KCU. N9JGI has a code class and is forming a c.d. section. KVE is recovering from a leg ailment. OVB has a new 813 rig as per January QST. RACES has been approved for Evansville. MVZ is having transformer troubles. KRJ is 160-meter mobile. AST is on the sick list. NRJ is civilian again. JNZ is new at Rensselaer. N9JZU is new at New Castle. PPD has 1st-class telephone license. The Kokomo Club has a code class with 10 hopeful prospects and also has 20 c.d. rigs on 145.2 Mc. CC attended the ARRL Dakota Division Convention. SNT rebuilt the rig with a pair of 814s p.p. JUJ is on low power now; her big rig went back on the air. Traffic: W9UJ 1352, NZZ 855, B9Q 515, JET 349, TQP 148, SNT 105, SFL 78, OIX 62, NVA 17, NTA 17, TG 40, ZRP 40, WUH 36, YB 36, EQO 34, YIP 33, CMT 32, BKJ 31, UWU 31, WRO 31, CC 30, KDV 27, YWE 25, EHZ 21, AON 20, DOK 20, QR 20, DKR 19, STC 11, ZIB 11, AB 10, PPS 9, WBA 8, BDP 4, DGA 4, YVS 3, NTR 2, SKP 2.

WISCONSIN—SCM, Reno W. Goetsch, W9RQM—SEC: OVO, PAMs: ESJ, GMY, IEN, XAX, RTF, UNJ. Nets: BEN, 3950 kc., 6 p.m. daily; WIN, 3625 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon. Sat., 0930 Sun. Mobile and c.d. frequency, 29,620 kc. VBZ cut back on traffic skeds because of school. CXV put up a new 14-Mc. antenna. UNJ reports the addition of Sat. operation to 9RN. VKR has his antenna back up. VZK has a new home-brew 200-watt final. ZAN received 20-w.p.m. CP sticker. KH6BBI is active from Milwaukee, where he is attending school. In attendance at the W9 DXCC meeting were CFT, EWC, KKK, RQM, LNM, RBL, RKP, FDX, and GIL. IQW is going a.s.b. FFC uses 600 watts to 813 final, while his mobile is a Bandmaster and Gonset 3-30 converter for all-band operation. New at Plainfield is VEN, who moved from Chicago. FXA is putting up a 20-meter beam. PBB is working on a.s.b. exciter. RQK has a new 75A-1. WWJ has worked 50 countries with a dipole antenna. The Manor Club's new officers are TRG, pres.; ZKB, vice-pres.; DKH, secy.-treas.; OVE, BZU, and JAW, dir. KXL donated a 25-ft. trailer to the Kenosha Club. YOX has a Viking II and HQ-129X. YOS operated the rig in the hidden transmitter hunt at Kenosha, with GRX the first to locate it. The MSOE Club has a kw. on 14 Mc. feeding a three-element beam 135 ft. high. ZCK built a VFO into his 2E26 rig. KG6ABD/9 has the rig on 3.5 and 7 Mc. 78AY/9 operates 7 Mc. with a 6146 rig. POY is interested in amateur TV. SC'H has 28-Mc. transmitter/receiver for mobile and portable use. VCH is active in MARS. DSP received a citation for technical development and GDW was cited for public service at NWRC's annual banquet. Merit awards were received by KHO.

WISCONSIN SECTION QSO PARTY

December 12, 1954

All Wisconsin amateurs are invited to take part in a QSO Party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability among the amateurs of Wisconsin.

Rules: 1) The Party will begin at 9:00 A.M. and end at 5:00 P.M. CST December 12th. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.W.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. A station may compete as a c.w. or 'phone station or both, as desired. 3) The general call will be "CQ Wis." 4) Information to be exchanged in each contact will consist of the QSO NR, RS or RST report, County, and name of operator. Example: NR 1 589X MARATHON RENO. 5) Scoring: Count 1 point for each information sent and 1 point for such information received, for a maximum of 2 points per contact. Multiply the total contact points by the number of different Wisconsin counties worked to determine the final score. Only contacts with other Wisconsin stations can be counted. 6) Logs should include date and time of QSO, call of station worked, number sent, number received, RST reports sent and received, name, county, band, type of emission, power input. It is suggested that sheets from the ARRL Log Book be used for logging and reporting. 7) A traveling trophy will be awarded to the operator with the highest score, regardless of whether that score has been made completely on c.w., 'phone, or a composite of both. Certificates will be issued to the first, second, and third place winners among 'phone, c.w., and Novice entrants. 8) Send logs to Edward R. Buchholz, W9VBZ, 3648-A North 8th St., Milwaukee 6, Wis.

See how many of your fellow Badgers you can work during the 8-hour contest period. Get on the air December 12th and meet the gang!

LEE, and REQ. MMR and DDB moved to Wausau. SJL completed new TVI-proofed rig with multi-band tuners and 813 final. FPE's mobile now operates at 1/2 kw. on 80, 40, 20, and 10 meters with band-changing and antenna-tuning while in motion! Traffic: (Sept.) W9VBZ 598, CXY 533, WWJ 168, LSR 66, RQK 59, SAA 48, FXA 46, RTP 35, GMY 27, UNJ 20, IKA 16, FFC 14, RQM 11, IQW 10, SZR 10, IBF 6, RKP 6, RUB 3, AEM 2, OVO 2, VKR 2 SDK 1. (Aug.) W9UNJ 66.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 8YQR; and Martha Shirley, 8ZWL. SEC: GCP. RM: SMV. PAMs: NEO and PRL. KXZ has volunteered as EC for Brookings County. GCP's report shows 64 full and 27 supporting AREC members with 14 official mobile units in the section. New General Class licensees: OQZ, RLA, EYB, N9VHB and N9VHC were issued to the daughters of VQC and BHP. N9VHZ received his ticket while working for VQC. GWS is attending State College and LXP is at Dakota Wesleyan. SCT received 15-w.p.m. Code Proficiency endorsement. The NJQ Net resumed operation Sept. 8th. 7CAK is in Custer Hospital. The Mitchell ARC is starting code and theory classes. GWL has a new bandwatching rig. The Redfield ARC has applied for ARRL affiliation. Officers are FQG, pres.; IER, vice-pres.; and BAN, secy-treas. SMV is running 350 watts on c.w. and f.m. 'phone. The C.W. Net reports 13 sessions, 83 QNL and traffic 35. Traffic: W8SCT 45, OJQ 39, MPQ 27, SMV 18, AYD 5, GWS 5, NEO 5, ZWL 4.

MINNESOTA — SCM, Charles M. Bove, W0MXC — Asst. SCM: Vince Smythe, 8GQG. SEC: GTX. RM: DQL and OMC. PAMs: JIE and UCV. K6EA was back in the Twin Cities and visited PRO. Army will operate portable from Bemidji. BHY has been busy building a new home in North St. Paul. The Dakota Division Convention was a big success. Minnesota was well represented by about 20 hams and XYLs from the Twin Cities. President Dosland, V.H.F. Editor Ed Tilton, and Director Al Gowan were there representing the ARRL. Highlight of the Convention was the big banquet, followed by initiation into that order known as the Royal Order of the Wouff Hong. A tour of Ellsworth Air Base and of the Black Hills and Mount Rushmore and a chuck-wagon feed of buffalo stew followed. RLQ now has his General Class license. ANU is temporarily off the air while building a new house. The Screw Ball Convention at Hayward now is history. It enjoyed an attendance of about 35 hams. Jean, IRJ, was elected Queen of the Screw Ball Convention. HY has been operating from Bay Lake near

Crosby and working into the Cities with only 8 watts on 75 meters. IRD, of Duluth, recently was married. Her new name is Mrs. Alvin Feller. The marriage was performed at Chanhassen by JDO, Justice of the Peace. TJH now is holder of a General Class license and is operating mobile with an Elmac. KFN and EUI bought a new Olds 98 and will be mobile with an Elmac. WMA soon will be using a Viking Ranger. Traffic: W0RLG 214, WMA 152, FCV 82, MVG 80, KFN 58, EHO 39, KNR 36, IRJ 35, TRX 31, LST 30, LUX 24, GTX 16, OJH 16, RVO 15, BZG 13, IKJ 13, JIE 12, MXC 9, OMC 9, PBI 9, QZK 8, TUS 8, BUO 7, GWU 7, HAH 7, ALW 6, CID 6, GWJ 4, GQG 3, TUC 3, OPA 1.

DELTA DIVISION

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — The Westside ARC is sponsoring a DX contest among its members with \$100 in cash prizes. WQP's XYL had the banana tree in the back yard chopped down; she didn't know that the OM's guy wire holding up his 20-meter beam was tied to it. WQP is now off 20 meters. UXG and his XYL are vacationing on the West Coast. ETV now is General Class. After working 10 for about 20 years, HR has moved up to 20 meters. The New Orleans ARC's dance and picnic held over the Labor Day week end was lots of fun. SGI made WAC but still is waiting for Europe and Africa QSLs. A new OO is WQX. The Caravan Club of Louisiana held a hamfest near Shreveport on Nov. 14th. DAR is back from a European vacation. LV is off to sea again; so is SGI. KGM is working on all-band vertical. We hear that KTB expects to be on a.s.b. soon. The Greater New Orleans ARC has started its code and radio courses at Loyola University. Classes are held Mon. and Wed. nights and will continue through the rest of the school year. HUT, SPZ, and DVS are new mobiles in New Orleans. Please mail your reports in on time. Appointments in all departments are open over the State. Your attention is directed to ARRL Bulletin No. 465. All aspirants to monitor appointments with MARS are invited to make the new ARRL Frequency Measuring Test to check their gear and ability. Traffic: (Sept.) W5NDV 99, MXQ 70, EA 38, SGI 8. (Aug.) W5NDV 166.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — Looks like the fellows have run out of news. They don't send me any and I am much too busy to have to listen on the bands to find out what they are doing. So, if you hams are doing anything and want it in print let me have it before the seventh of the month. GEM is the mobile net on the Gulf Coast and meets each day on 29.6 Mc. at 1930. SRT is off the air; work got him. OTD has his new Ranger, thanks to the Jackson Hamfest. JIP, of Jackson, died Sept. 23rd. We'll all miss him. RCF is having trouble getting his mail. A Very Merry Christmas to all of you and may your signals be always Q5 and 9-plus. Traffic: (Sept.) W5WEU 95, VME 76, JHS 40, DRG 11, YHB 8, OTD 5. (Aug.) W5WEU 128, JHS 51, YHB 20, VME 10, OTD 4, DRG 2.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PEP. RM: WQW. FL is taking a well-deserved Mexican vacation and says he may run into a 'phone ham or two, south of the border. HHK worked 10 states on 2 meters during the V.H.F. Contest. WGI now is 5HEH. ETS is recovering from a recent illness. AKB has moved to Virginia. WQT moved to a new QTH, still in Clarksville. The Elizabethton-Johnson City Club now has been named the Watauga Radio Club, with VFL, BB1, and VDN as officers. Another father-son team in RVA-HLP. PAL taken to the air, literally, now is a partner in a plane. The Kingsport Club had an outdoor meeting, complete with a weiner roast. Thanks to UVS for an admirable job on the Crossville picnic pictures. HFA is a new active ham in Kingsport. VUA sends a nice newsy letter and suggests that local skeds for 75 meters be made early because of skip conditions. New Memphis 2-meter stations are BAO, GIS, and VNA. FRB, HML and HNJ. RAQ/UDI have auto calls installed on 2 and 10 meters. PVD now is up to 101 countries and is awaiting QSLs from 4 new ones worked this month. UWA reports the new Upper Cumberland Net is going along nicely, averaging 8 stations per session. MLL, LC, WQW, HEZ, and EXR report they were treated royally at the St. Louis Hamfest. COY, FQO, and GZC visited WQW. Traffic: W4PL 1274, OGG 744, FYU 190, PEP 166, HHH 129, WQW 128, IIR 96, BQZ 78, SCF 51, UWA 50, TZD 40, OFZ 37, GZC 36, AKB 22, VJ 17, HML 14, ZJY 14, RRV 13, UOA 13, PAH 10, PVD 9, RET 8, BAO 6, RMJ 6, TSN 6, DCH 4, UIO 4, FLW 2, TIE 2, VVG 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — KKW turned in a very fine report on the KYN, and shows that activity is on the increase. There are 40 active stations on the net, with the following stations earning net certificates: LAY, FGC, HBA, SUD, ZDA, ZCM, and K4FW. CDA still is building. His latest is a 100-watt transmitter for 75-meter 'phone. K4FBW is building a 100-watt final, plus a 2-meter rig. KKG is active only on 15 meters. MWX still is plugging away with KYN and UTL. RYM, newly-appointed EC, is reorganizing AREC and emergency activi-

(Continued on page 82)

BECOME AN HONORARY

ANOTHER BIG

\$1,000 HAM SHACK GRAND PRIZE

Just listen to this! Grand prize is a complete ham shack worth *one thousand dollars!* The shack includes the finest of all receivers — the world-famous HRO Sixty — with a matching speaker PLUS a deluxe transmitter, a semi-automatic key, a microphone and a rotary antenna!

NC-88 AWARDED MONTHLY



Even if you don't win the Grand Prize, you're eligible to win a monthly prize of a brand new NC-88 — a world-beater in receiver value! Features include calibrated bandspread for 80, 40, 20, 15, 11 and 10 meter bands, advanced AC superhet circuit using 8 miniature tubes plus rectifier, a tuned RF stage, two IF stages, two audio stages and a host of other features!

OFFICIAL RULES

1. Describe the features you would like in your "dream receiver." Suggestions can be as technical or non-technical as you like — anything from a circuit design to the style of a knob. Drawings or diagrams may be used. Please write legibly. Enclose your suggestions with a signed entry blank and mail to: Contest Department, National Company, Inc., 61 Sherman Street, Malden 48, Massachusetts.

2. You can mail as many suggestions with an entry blank as you wish. Be sure that a separate entry blank accompanies suggestions mailed at different times. You may file as many entry blanks as you wish.

3. An NC-88 will be awarded to the winner of each monthly

contest. A grand prize of a \$1,000 value ham shack will be awarded for the entry judged best from all winning monthly entries. A certificate will be awarded to each entrant, making such entrant an honorary National Company, Inc. engineer. The contest will continue through midnight February 28, 1955.

4. Anybody is eligible to enter the contest except employees of National Company, Inc., its advertising agency, and their immediate families. To be eligible an entrant must send a signed entry blank with his suggestions. To be eligible for any particular month's contest entries must be postmarked no later than midnight on the last day of the specific month. Winners will be notified by mail.

5. Entries will be judged by a three-man panel composed of competent technically qualified personnel of National Company, Inc., each exercising independent personal judgment. All decisions of the judges will be final and will be decided by majority vote.

6. All suggestions submitted in this contest, whether awarded prizes or not, become the exclusive property of National Company, Inc. and are not subject to being returned. Entrants grant to National Company, Inc. all rights to suggestions, including the right to patent and/or copyright the suggestion. National Company, Inc. has no obligation to entrants other than to award prizes in accordance herewith.

NATIONAL ENGINEER!

MONTHLY CONTEST...

Here it is! Another big month of National's exciting new contest for radio amateurs and shortwave listeners!

You've probably often thought of features you'd like included in your "dream receiver." Well, now's the time to put them down on paper! They may win you a brand new NC-88 or a complete \$1,000 ham shack!

National's sole purpose is to find out what the *majority* of you want and don't want in a receiver. (Acceptance of your entry does not mean it will be included in future receivers and submission of an idea doesn't obligate National to use it.)

Whether he wins or not, each entrant will receive a certificate as an "HONORARY NATIONAL ENGINEER."

The entire contest closes on February 28. All entries must be postmarked no later than midnight of that date.

So, hurry, pick your official entry blanks at your National distributor.*

tuned to tomorrow



National

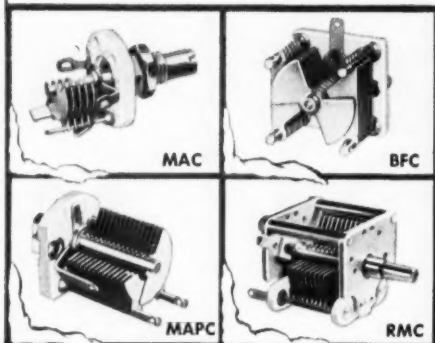


NATIONAL COMPANY, INC., 61 SHERMAN ST., MALDEN 48, MASSACHUSETTS

* If there is no National distributor near you, write direct to the company, Attention Contest Department, for your entry blank.

In Equipment You Build Yourself

USE HAMMARLUND CAPACITORS



The Precision Components that give trouble-free service!

Here are the variable capacitors built by precision craftsmen with long experience, and with the knowledge that quality is the major requirement for good ham operation.

These components have been designed with the amateur and experimenter in mind since the first models were produced nearly 30 years ago.

Long, trouble-free service and continuous fine performance are assured when Hammarlund variable capacitors are used in your gear. You wire them in with the certainty that they will continue to function efficiently for the life of the set.

Have you received your copy of the new Capacitor Catalog? It lists Hammarlund's complete line of standard capacitors sold by responsible dealers from coast to coast.

SEND TODAY!



HAMMARLUND

THE HAMMARLUND MANUFACTURING CO., INC.
460 WEST 34TH STREET • NEW YORK 1, N. Y.

(Continued from page 70)

ties around the Town of Henderson. You should be hearing K2CYI from his home QTH now. SBI, your Section Communications Manager for Kentucky, invites you to send monthly reports of your activity. Traffic: WAKKW 122, K4FBW 96, ZLK 72, W4SBI 39, WNH 32, CDA 28, SYD 28, MWX 17, K2CYI 16, W4JCN 13, NIZ 10, AZQ 9.

MICHIGAN—SCM, Fabian T. McAllister, W8HKT—Asst. SCMs: Joe Beljan, 88CW; and Bob Cooper, 8AQA. SEC: GJH. RMs: URM and NUL. The traffic nets have started in earnest and we have noted a few NC8s on hand. You fellows who have taken over will never regret it. RJC has been off the air since early in September and ELW was the only one to make BPL this month. Incidentally, when your traffic totals put you in the BPL class don't forget to mention on your report whether your station was operated as a one-operator station, or a more-than-one-operator station. Remember, too, that the only traffic which may be counted is traffic handled on amateur frequencies. For instance, a message received and relayed on MARS counts "zero." If received on MARS and relayed on an amateur frequency it counts "one." It must be handled on amateur frequencies to count toward your traffic total. The THIN Net is in operation again this year for you fellows who cannot check into the evening nets. Look for it at noon every weekday on 3663 kc. New officers of the Genesee County Radio Club are ITZ, pres.; QIC, OBM, and IFK, vice-pres.; JAX, secy.; and ENQ, treas. The Blossomland Club recently elected SCs, pres.: QPG, vice-pres.: QOD, secy., and QBN, act. mgr. We recently saw an interesting article about the wildlife "lectures" given by NEJ/NEK. It seems that John and Marianne have been discussing their work at the Game Refuge in QSOs with several school radio clubs; and the clubs found it so interesting that they made recordings of the QSOs, playing them back during class periods. WXO will be working and teaching until after Christmas. SWG has his receiver in for a factory check-up, and dampness in the basement caused a blow-out of EGI's buffer power transformer. (We seem to remember the stunt of burning a low-wattage lamp bulb in the cabinet to keep the moisture out). SWF has a new folded dipole, and YKC is looking for a crew to put up his new 35-foot poles. The Edison Club loaned its emergency gas-engine generator to the Royal Oak General Hospital for emergency lighting in the delivery room during a recent power failure. During the September V.H.F. Party NOH made 48 contacts in six sections. Lou now has his sights on a 400-watt 2-meter rig! Traffic: W8ELW 572, ILP 169, NUL 121, FX 98, MLR 93, RTN 92, NOH 76, ZLK 46, QIX 43, JKK 31, WYO 31, PHA 24, AUD 21, HKT 21, SWG 20, IV 19, NEK 19, OQH 12, DSE 8, EGI 7, TQP 7, HSG 6, RJC 6, FSZ 4, PUV 3, SCW 1, WVL 1.

OHIO—SCM, John E. Slinger, W8AJW—Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF. SEC: UPB, PAM: HUX. RMs: DAE, FYO. Although nobody made the BPL this month, traffic is definitely on the upgrade. ROX has been made an ORS and FJP an OBS. DAE took a trip to the Poonos early this month. QVJ, Central High Ham Club station, is on the air on 160-meter 'phone and 40-meter c.w. According to all reports UPB is doing his normally excellent job as SEC. There are very few amateurs in this section who do not know him personally. GZ is greatly pleased with the W8 QSL Bureau's super service. AQ has purchased a Ranger rig and installed a 45-foot vertical. BUM is visiting in W6-Land. LJ will move to Cleveland around Nov. 1st. ROX is rebuilding to a 4-250A. LZE has acquired a Viking II with VFO and Matchbox. LVF will spend a three-month duty tour at Fort Riley, Kans. The Cleveland North East Club sponsors Novice and Technician Class license exams on the 2nd and 4th Fri. at 18415 Nottingham. LCC is on 2 meters. OQT is working as a sales engineer for Bendix Radio. KYH now is on s.a.b. s.c. YMB succeeds RRA as Northeast's delegate to the CACARC. KYH is the new trustee of CCO. About 300 amateurs attended the Cuyahoga County c.d. meeting Oct. 1st which was conducted by LYD, IJZ and IWP have been the most consistent winners of the Cleveland Area hidden transmitter hunts, according to AJH, Cuyahoga County EC. The West Park Radiop Emergency Net, 29,520 kc., averages 25-30 stations Mon. at 10:00 P.M. The Cincinnati Stag Hamfest of Sept. 12th had an attendance of approximately 800 amateurs, one of the section's big events. On the same day the Findlay Hamfest produced a turnout of over 300 people, the largest crowd in several years. Winners in the Lucas County September hidden transmitter hunt were EDL on 10 meters and WIF on 160 meters. The *Peri Hamilton Bulletin* mentions that QLIH has been called to service and HXB lectured on grid-dip oscillators at the last meeting. The Cleveland Wireless Assn. has reelected BXB, pres.; JNF, vice-pres.; and FSP, secy.-treas. The Dayton RF Carrier reports that OVG again is chairman of the club code and theory school. His assisting professors are KLM, PLV, and ZOF. The Springfield Q-5 informs us that an informal antenna forum is held at the ENS antenna garden from 1:30 to 4:00 on Sun. afternoons. The Columbus Caracape states that FYW finally has gotten on 2 meters. LWE has received his General Class license. LND has gotten a 2nd-class commercial ticket; LVF and KMM have but to complete their graduation thesis to receive their PHDs. HUE has con-

(Continued on page 84)



HINT NOW For a New HQ! for year 'round better reception!



The "HQ-140-X"
Communications Receiver

The receiver that belongs in every Ham's shack!

Whether your "HQ-140-X" receiver comes as a gift, or you buy it for yourself, you can be sure it will give years of reliable, quality performance.

Its many outstanding features are evidence that it was built for those who appreciate professional standards. Extremely accurate frequency setting is achieved because of the HQ-140-X's carefully calibrated bandspread dial. The Hammarlund patented 455 Kc crystal filter and phasing network makes it possible to change bandwidth without the slightest detuning.

The separate oscillator (6C4) and mixer (6BE6) contribute to the high degree of oscillator stability.

Low-loss tube sockets, ceramic bandswitches, temperature compensating capacitors, zero temperature coefficient ceramic trimmers and a bi-metallic compensating plate all keep frequency drift to less than 0.01%, from the lowest frequency (540 Kc) to the highest (31 Mc).

These are examples of the many features that make the "HQ-140-X" the receiver that belongs in every Ham's shack.

Detailed information and specifications on this fine receiver are available. Ask for Bulletin N40.



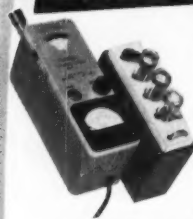
HAMMARLUND

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460 WEST 34TH STREET • NEW YORK 1, N. Y.

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Heathkit GRID DIP METER KIT



MODEL GD-1B

\$19.50 Ship. Wt.
4 lbs.

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

The invaluable instrument for all Hams. Numerous applications such as retuning, neutralizing, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 1/2 meter Ham bands. Complete frequency coverage from 2–250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

Heathkit ANTENNA COUPLER KIT

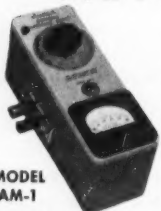
The new Heathkit Antenna Coupler Model AC-1 was specifically designed to operate with the Heathkit Amateur Transmitter and will operate with any transmitter not exceeding 75 watts RF input power. Rugged design has resulted in a sturdy, well shielded unit featuring a copper plated chassis and shield compartment. Coaxial 52 ohm receptacle on the rear of the chassis connects to a three section Pi-type low pass filter with a cut-off frequency of 36 Mc. Tuning network consists of a variable capacitance and tapped inductance in an impedance matching unit. Capacity coupled neon lamp serves as a tuning indicator and will also provide a rough indication of power output.



MODEL AC-1

\$14.50 Ship. Wt.
4 lbs.

Heathkit IMPEDANCE METER KIT



MODEL
AM-1

\$14.50 Ship. Wt.
2 lbs.

tive null indicator. Shielded aluminum light weight cabinet. Strong self supporting antenna terminals.

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance and antenna transmission line impedance; approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AM-1 is 0–150 Mc and range of impedance measurements 0–600 ohms. The circuit uses a 100 microampere Simpson meter as a sensi-

HEATH COMPANY
BENTON HARBOR 9, MICHIGAN

structed a new 813 rig, and LWJ is active on 2 meters. Eastern Ohio's *Ham Flasher* relates that NKK is a baritone horn tooter in the Salem American Legion Band. CQZ is a new mobile, ZAG is working for Bendix Radio in Alaska, PJK has increased McDonald's amateur population to two, OKC and LZR have new mobiles, and AUE has had his address changed to *Foster, Traffic*. (Sept.) W8FYQ 338, FPB 308, ARO 244, MQQ 179, RCL 169, DQG 153, LHV 129, FPZ 125, DAE 86, RO 75, GDB 60, AMH 57, HNP 55, IJH 44, AL 42, DG 42, AJW 33, HIF 33, WF 28, ROX 26, HUX 20, LMB 16, GZ 14, APC 12, LZE 11, AJH 8, DMD 7, FJV 7, HXB 7, AQ 6, DL 6, EQN 6, KIH 6, OPU 6, RZ 6, ET 5, CSN 4, HPP 4, NQ 4, PBX 4, LT 2, OQP 2, AYR 1. (Aug.) W8DQG 48, PBX 4.

HUDSON DIVISION

EASTERN NEW YORK—SCM, Stephen J. Neason, W2HJ—SEC: RTE, RM: TYC, PAMS: GDD, JQI, JIG. I regret to announce the resignation of KBI as RM for this section and as manager of NYSS. Our sincere thanks to Carl for his long service and excellent record. Congratulations to OPD for his long service and excellent record. I congratulate to OPD of the Western New York section, who is the new manager of NYSS. WVS has a new Gonsel VFO and a sixteen-element beam on 144 Mc. LWI has moved from Long Island to Pok and has an 829 final on 144 Mc. K2ANI has a 100-watt mobile on 144 Mc. K2BAR, K2IDRV, and KN2IQN have built converters designed by RTE for 144 Mc. AIH will be in Boston for about one year and will be home week ends. He will be active from Boston on 3.9 and 144 Mc. K2JUS has returned from the Army and is active from Port Jervis. HQF and KN2HIT are new members of the Rockland County ARCC-C.D. Net. ZBS and MIHE have new converters for 144 Mc. OKI received his 15-w.p.m. sticker. K2BSD has a new Telrex short beam going on 14 Mc. and is handling long-haul traffic. 1DF, of ARRL, was well received at the SARA. A record crowd was on hand to enjoy his talk on "Impedance Matching." OAK has a new 4-125A final working on all bands using both A1 and A3 emission. 3FWT was a recent caller at ECU. The IHRL has resumed publication of *Zerobut* and opened the first meeting of the season with a demonstration of closed circuit TV by K2HEF, AWQ and KN2IRQ were recent visitors at ARRL. It is with regret that we report the death on Oct. 9th of Harry C. Condon, W2JQI. A ham for twenty years, he was active on 2-, 10-, 75-, and 160-meter phone, was the originator of the Albany Amateur Association Directory and was one of the few honored by the Albany Amateur Association and given life membership. K2BAJ has left for Cal. Tech. and will operate portable from W6-Land. WRI is working with s.a.b. PCP and K2AEH are having fun with FSK equipments. NGQ has a new wet-pocket beam working on 144 Mc. Don't lose your appointment, check the endorsement date now. Traffic: (Sept.) K2BSD 257, W2LWR 64, K2BE 55, W2GDD 39, LI 34, YXE 25, K2EOQ 15, W2SZ 13, TVC 5, APH 2. (Aug.) W2OKI 3.

NEW YORK CITY AND LONG ISLAND—SCM, Carleton L. Coleman, W2YBT—ASST. SCM: Harry Daniels, 2TUK. SEC: ZAL, PAM: JZX. RMs: VNJ, LPJ. Please continue mailing reports to TUK. Other mail for YBT should go to his new address, P. O. Box 1011, East Hampton. Congratulations to OBU on his reelection as Hudson Division Director. JOA again leads the list of BPL stations, but school slows down his activities. Ditto for IVS, IVI, K2s CQP, ABW, and WPT. School first, BPL second, that's the ARRL way! LPJ lost one week when his 4D32 went West, but still managed a BPL total. VNJ reports the NLI Net (3630 kc., 7:30 P.M. nightly) now is up to full level, but outlets still are required in Suffolk. How about it, gang? K2JFZ, ex-8CT8, joins the gang at AEE. K2CRH requests interested Brooklyn 80-meter stations to join the BAREC Emergency Net on Sun. at 11 A.M. on 3755 kc. The Tu-Boro Club is celebrating its 20th anniversary this year. FKR is new AEC in Queens. JBQ and his powerful 25-watt on 144 Mc. hit 12 sections in the V.H.F. Contest and accounted for W8s in Ohio, Michigan, and West Virginia in the band-opening. GP's antenna came down in Hurricane Carol, but Don is back in business. IN is another addition to the s.a.b. gang on 40 and 80 meters. K2CMV is planning early for next summer's mobile season with a low-power rig under construction. K2APZ, Brooklyn College station, returns to 75 meters. K2CVI is back from the Army service and plans 75- and 20-meter mobile operation. EBZ invites all those interested in RTTY to contact him for information on the newly-formed Amateur Radio Teletype Society. KN2JAS and his AT-1 and S38-C need only W6 and W7 to complete all Novice districts. HJL, with 15 crystal-controlled watts, made WAS and WAC. JBQ is due back from K6-Land. KN2JGZ is a new Novice in Malverne. DLO reports hearing 8 stations on 420 Mc. during the V.H.F. Contest. His 420-Mc. transmitter will be ready for the next V.H.F. SS. K2HID and his Viking I picked up 5 new countries. JZX reports that Second District YLs meet the 3rd Thurs. on 3900 kc. at 9:30 A.M. New YLs in the section are KN2JHQ, the XYL of NJL, and KN2s IOI and IZC. K2H2B didn't take long to drop the "N." KGN, Brooklyn EC, reports the new shack at Boro C.D. Control is FB. K2GJK, Amityville Memorial School, is active on the Novice bands with K2AMP as trustee. K2DOQ is

(Continued on page 88)

New

Heathkit VFO KIT



MODEL VF-1

\$1950

Ship. Wt. 7 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures outstanding stability. Coils are wound on heavy duty ceramic forms, using 112 or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at 45 amperes and 250 volts DC at 15 milli. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/2" crystal holder. Construction is simple and wiring is easy.

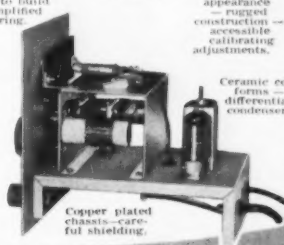
- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 7 Band coverage, 160 through 10 meters—10 Volt RF output.
- Copper plated chassis—aluminum cabinet—easy to build—direct keying.

Open layout—easy to build—simplified wiring

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.

Ceramic coil forms—differential condenser.



Copper plated chassis—careful shielding.

Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

\$2950

Ship. Wt. 16 lbs.

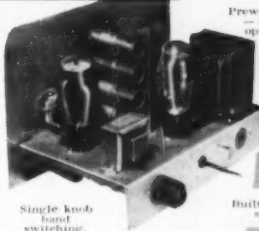
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 Oscillator-multiplier.
6BL6 Amplifier-doubler.
5U4G Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/2 inch high x 13 1/2 inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils—metered operation.

Rugged, clean construction



Single knob band switching.

52 ohm coaxial output.

Built-in power supply.

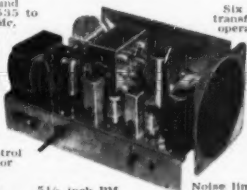
Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable HFB oscillator circuit.

RF gain control with AVC or MVC.



5 1/2 inch PM Speaker Headphone Jack.

Six tube transformer operative.

Electrical bandspread and scale.

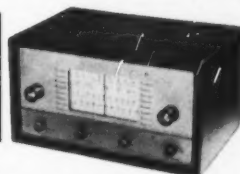
Noise Limiter—standby switch.

SPECIFICATIONS:

Range 535 Kc to 35 Mc
12BE6 Mixer-oscillator
12BA6 1. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 R. F. O. oscillator
12A6 Beam power output
5Y3GT Rectifier
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio.

Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

\$2550

Ship. Wt. 12 lbs.

CABINET:

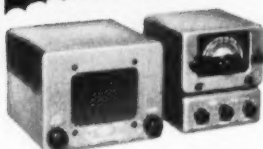
Proxylon impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

HEATH COMPANY
BENTON HARBOR 9, MICHIGAN

A big red box

and a cheery Merry Xmas tag . . .

Simple, traditional Holiday-spirit additions to any piece of Gonset equipment . . . for the most enjoyable Xmas gift package anyone could desire.

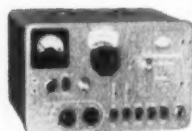


Super-ciever

Super-ciever in conjunction with any good quality amateur converter, such as Gonset Super-Six, provides a complete mobile receiver capable of outstanding performance on both phone and C.W.

Unit is xtal controlled for maximum stability and utilizes 8 tuned circuits at 262 kcs for high selectivity. Self-contained vibrator power supply furnishes voltage regulated power to converter and to BFO. Latter is highly stable with adjustable pitch control. Separate RF and AF Gain controls, adjustable squelch, effective noise clipper. Built-in speaker with connections for external speaker, if desired. Pertinent controls are on a small control head which mounts near the converter for "fingertip" operation. Connecting cables and plugs are supplied. Power pack is designed for quick conversion to 12V DC.

Net\$119.50



Commander 60 watt Transmitter

An extremely compact, highly effective 60 watt transmitter for mobile or fixed service. Normally xtal controlled, may also be used in conjunction with external Gonset "tubeless" VFO. Highly flexible output circuit, readily shifted to pi network if desired.

FREQ. RANGE: 1.7-54 mcs continuous.

TUBES: RF-6AG7, 6146. AF-12AT7, two 7C5's.

POWER REQUIREMENTS: 300V-500V @ 200-225 ma (phone) and 6.3V, AC or DC @ 3.15A. Up to 60W input, phone or CW.

MODULATOR: Class AB2 tetrodes and integral hi-level speech clipping.

ANTENNA FEED: All conventional feed lines, Coax ribbon or open line or direct to Marconi antenna.

MICROPHONE INPUT: Any standard carbon or PA type hi-impedance dynamic or crystal.

Complete with tubes, less power supply, xtal and microphone.

Net \$124.50

RF Power Amplifier



Here is a true general purpose "Power Package" for SSB, CW, AM phone. Its self-contained with a husky, dual-voltage bridge power supply . . . has a highly flexible pi network output circuit. Provides full band-switched coverage of 10-11-15-20-40 and 80 with provisions for adding 160.

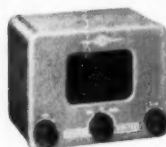
This is an ideal amplifier to follow any low-power SSB exciter. Its highly stable, linear (Class AB) and has excitation control and complete metering to facilitate SSB operational adjustments. Operation is in no manner confined to SSB since AM phone with a few watts of modulated drive is readily possible. C.W. operation at substantial output is merely a matter of providing a low-power keyed RF input.

POWER OUTPUT RATINGS

SSB-250W (Peak envelope output)

CW-220-240W output. AM-80-100 watts carrier.

TUBES: 4-807's in completely unique electro-mechanical arrangement, stable, free from parasitic or self-oscillation. 4-866JR's in bridge. Dual output heavy-duty 80 mfd output filter for excellent dynamic regulation.



Monitor

Use it for code practice at any time but . . . since it is also an excellent monitor for phone or C.W. . . . keep it in service as a permanent station fixture.

This unit can be used without danger of shock since the 115 volt AC power supply is isolated so that neither of the two external key or earphone leads are "Hot" to ground.

Audio tone and volume are individually adjustable and made audible on panel mounted speaker, (or external earphones). A small amount of Rf, (link-coupled from the transmitter) operates the unit when used as a monitor. The actual transmitted signal operates the internal audio oscillator for C.W. . . . the rectified audio component is made audible on speaker, (or earphones for "side tone") where utilized for phone operation. It's attractively finished, functional.

Net\$19.50

A bit too large to fit under your Xmas tree but . . . there will be no difficulty in finding adequate roof space to contain its 16 1/2 foot tip-to-tip element length. (Boom is 10') Light-weight too . . . easily rotated by any good TV-type rotator.

Its effective! Performance, in all kinds of weather, approaches that of a full-length 20 meter beam. High Q silver plated, copper tubing inductors, are self-supported . . . ensure unimpaired, wet weather operation.

Bow-tie, broad-banded elements . . . very low SWR . . . good F.B.R. . . . 52 ohm line feed . . . symmetrical pattern.

Net \$59.50

Bantam Beam



GONSET CO.

801 South Main Street Burbank Calif.

The
PERFECT
2 meter
PACKAGE



"Communicator"



Physically, a comfortably-carried 20 pound package . . . but . . . a completely unique package which contains all circuit elements usually found only in a well designed 2 meter fixed station of conventional size. Here truly is compactness without compromise!

Hand-out features

Sensitive superhet receiver with "Cas-code" front-end. Calibrated dial tunable from 144 to 148.3 mcs. . . .

Three stages I. F.

The famous Gonset noise clipper . . .

Adjustable squelch

Built-in panel speaker—earphone jack . . .

Universal self-contained power supply for 6 volts DC and/or 115 volt AC

Transmitter uses 2E26 final at 5-7 W output .

High level plate modulation

Modulator can also be used to provide a PA system for emergency situations

Frequency control is by crystal, (standard 8 mc types) or by Gonset 2 meter VFO. (Separate)

Coax fitting on case top accepts telescoping antenna, (supplied) or connects coax line to external antennas.

DE LUXE COMMUNICATOR net 229.50

STANDARD COMMUNICATOR net 209.50

(Less squelch, earphone jack, etc.)

2 meter VFO

A fitting companion unit for the Communicator, but also well suited for use with almost any 2-meter transmitter. Provides stable, calibrated VFO (24 mc. output) . . . brings all the advantages of I.F. VFO to the 2-meter operator. . . .

Net 84.50



GONSET CO.

801 South Main Street, Burbank, Calif.

To start the New Year right... 6 meter Communicator

Now . . .

a brand new Communicator which operates on the amateur 6 meter band. This highly interesting band offers virtually the same general coverage possibilities as 2 meters . . . adds an important PLUS . . . the thrill that comes when you contact stations hundreds . . . or thousands . . . of miles away when the band opens for sky-wave communication.

HIGHLIGHTS:

General appearance is identical to the 2 meter Communicator. Same size, same weight, same outstanding performance.

Receiver utilizes the well-known Gonset cascade front-end for high sensitivity, double conversion for increased I.F. selectivity usable on 6 meters. The receiver also tunes down to 49 mcs, permits spotting commercial stations to clue band "openings."

Transmitter delivers 8 to 10 watts output with either 6 volt DC or 115 volt AC supply.

De luxe model only.

Model 3049—6 meter Communicator

6V DC/115V AC.....net 229.50

(less mike and xtal.).

NEW 12 VOLT COMMUNICATOR MODELS.

Model 3058—6 meter Communicator

12V DC/115V AC.....net 229.50

Model 3057—2 meter Communicator

12V DC/115V AC.....net 229.50

(Both de luxe models).

A very Merry Xmas and
a healthy, happy and
prosperous New Year.

THE GONSET GANG.





THE
NEW

PRECISION MODEL 120

GIVES YOU WHAT YOU WANTED IN A
HIGH SENSITIVITY
MULTI-RANGE TEST SET

- ✓ MORE RANGES
- ✓ AN EXTRA-LOW RESISTANCE RANGE
- ✓ AN EXTRA-LOW VOLTAGE RANGE
- ✓ AN EXTENDED LOW CURRENT RANGE
- ✓ A LARGER METER SCALE FACE
- ✓ POSITIVE CONTACT JACKS and PLUGS

Compare These Wide Spread Ranges and Features:

- ★ 8 DC VOLTAGE RANGES: 20,000 ohms per volt.
- ★ 8 AC VOLTAGE RANGES: 5,000 ohms per volt.
0.1-2-3-12-60-300-600-1200-6000 volts.
- ★ 8 AC OUTPUT RANGES: same as AC volt ranges.
- ★ 7 DC CURRENT RANGES:
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- ★ 5 RESISTANCE RANGES: self-contained
0-200-2000-200,000 ohms, 0-2-20 megohms.
- ★ 8 DECIBEL RANGES: -20 DB to +77DB.
0 DB = 1 Milliwatt, 600 ohms.
- ★ EXTRA LARGE $5\frac{1}{4}$ " RUGGED 'PAGE' METER:
40 microamperes sensitivity, 2% accuracy.
- ★ 1% MULTIPLIERS and SHUNTS
- ★ TWO JACKS SERVE ALL STANDARD RANGES
- ★ "TRANSIT" SAFETY POSITION on range selector
protects meter during transport and storage.
- ★ CUSTOM-MOLDED PHENOLIC CASE and PANEL

MODEL 120... complete with internal ohmmeter
batteries, banana-plug test leads and detailed
operating manual. Overall Case Dimensions
5 $\frac{1}{2}$ " x 7" x 3 $\frac{1}{2}$ " **Net Price \$39.95**

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Export: 458 Broadway, New York 13, U. S. A.

Canada: Atlas Radio Corp., Ltd., 560 King St. W. Toronto 28

(Continued from page 84)

building a 40-watt rig for all bands now that he has dropped the "N." KN2IYK used the WIAW Code Proficiency Run for the Novice code test. New members of the NYC are 4E0J/2 and KN2IMG. The Fordham Club gave exams to Novices JDM and JDR. IRY is moving to Lake Ronkonkoma. YBT has been elected an honorary life member of the Mid-Island RC. K2GZE is working on the TVI problem in an N.Y.C. apartment house. K2DDC, ex-secy. of Columbia University RC, reports from Ft. Dix where he is stationed with the Army. VNJ, the NLI RM, may have some competition if his son obtains his ticket. QBR, TUK, and K2GBZ are active at Naval Reserve station K2NR1, Freeport. With 1955 around the corner, let us endeavor to keep our operating at a high level. Traffic: (Sept.) W2JOA 1184, KFY 905, KEB 654, BO 612, LPI 572, K2EP 520, W2JZX 512, IVU 329, K2CQP 264, W2VNI 193, OMG 62, AEE 56, OME 39, EC 36, JGV 30, K2ABW 27, CRH 18, W2LGR 16, K2DVT 7, W2PF 7, IAG 6, IYS 4, JBQ 4, K2CMV 3, DDC 3, W2GP 3, IN 3, ORU 2, K2HID 1, (Aug.) K2EP 675, W2JGV 177, LPI 144, VNJ 60, JBQ 3.

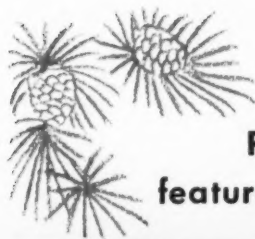
NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — Asst. SCM: Charles Teeters, K2DHE, SEC: IIN, PAM: CCS, RMs: NKD, EAS, CGG. Your SCM is pleased to announce the appointment of IIN as the new SEC for Northern New Jersey. John has had many years of experience in this field, having formerly been SCM and SEC. Please refer all ARCC matters to him at 57 Sayre St., Elizabeth. IIN replaces NKD, who tendered his resignation because of pressing business commitments in connection with his new work assignment. The section extends its sincere thanks to NKD for his past efforts as SEC. All correspondence to your SCM should now be sent to 709 7th Ave., Asbury Park. Lloyd has a new house and also a stiff neck from looking up for a place to put the new sky wires. New officers elected by the Bloomfield Radio Club are K2ICN, pres., W2ANG, vice-pres.; GC and K2BAY, secy.; W2SUX, treas. The Club holds meetings at 8:00 the 1st and 3rd Wed. of each month in the Community House, 82 Broad St., Bloomfield. New members are welcome. The section is saddened to hear of the illness of YVQ. Doc has been taken to the polio ward of the St. Elizabeth Hospital in Elizabeth. He has been given a Conset for 2 meters and is on during the day, and from 7 to 10 p.m. on 145.5 Mc. during the evening. The gang in Linden has been working Doc regularly and we hope that everyone will pitch in and give him a call. If you are mobile on 2 meters drive past the hospital and give him a call. The Raritan Valley Club has lost its vice-president to Florida, but the Club is in the process of rejuvenating and has started winter meetings on Tue. nights in the club house on Wilson Road. The club house is in better shape because of the efforts of K2CHI and GAS. NQA is now a special police officer in his township. NIE has been off the air because of some serious fishing up in New York State. K2DDM is mobile on 2 meters and Luke also is on 2 meters from the home QTH. Excellent OO reports were received from TPJ, NIV, and K2BWQ. The Monmouth County 2-meter Net is back under OUS after the summer months. K2ICE is putting up a twenty-element beam for 2 meters, and HNA is trying sixteen elements. OFM certainly started something in Asbury Park. Henry's brother Bill is now K2ARQ, his wife Enis is KN2HIA, Bill jr. is K2DCI, and daughter Phillis is KN2HHQ. LRO is getting the bugs out of his 20-meter rig with one hand while building a 2-meter rig with the other. Congratulations to K2CTL on the arrival of a baby girl, his first. Traffic: K2BWP 277, W2EAS 129, K2BWQ 113, GAS 82, W2OXL 58, K2EUN 46, W2CZV 12, BRC 11, OUS 8, CFB 2, NLY 2, K2BAY 2, GER 2, W2ZPD 1.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, W0PP — This report was submitted by A. J. Ploog, 0SCA, Asst. SCM, PP is enjoying a short vacation. QVA had a session in the hospital but is now home. MGC and UH are new TLN numbers. NWF, of Ames, moved to Arizona. Iowa is losing an FB traffic man, QJF and QQA, both of Mt. Pleasant, now have General Class tickets. LAC has a new Elmac mobile receiver. GZ has both an Elmac mobile receiver and a transmitter. 3LH received his ORS appointment recently. TED is back in Waterloo after a hitch in the U. S. Air Force. PAN still is looking for 20 more states for his WAS. The Waterloo Club is very active in c.d. and hidden transmitter hunts. Blackhawk County now has emergency-powered stations in every town in the county, regardless of size. Fellows, please send in the reports of your clubs and stations. We can't print it if we don't get it. Iowa ranks second in our division in the amount of traffic handled but last in reports to the SCM. Even if you don't handle traffic your SCM would like to know what you and your club are doing. Thanks a million to those who did send in reports. Traffic: W0HBR 1735, 8CA 1259, CZ 235, LJW 116, BLH 86, KJN 19, NGS 13, PIR 10, FDM 8, PAN 8, EHH 7, QVA 6, RMG 6, SWD 6, NYX 5, FNR 3.

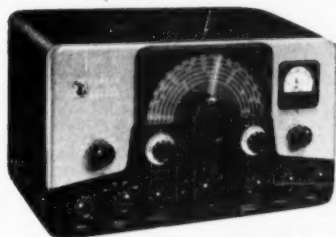
KANSAS — SCM, Earl N. Johnston, W0ICV — SEC: PAH, RM: KXL, PAM: FNS. The Lawrence Amateur Radio Club held a picnic Oct. 10th. The CKRC of Salina already is making plans for next year's Field Day. CKRC

(Continued on page 86)



This Christmas...

PICK YOUR POWER from these 4
feature-packed JOHNSON TRANSMITTERS!

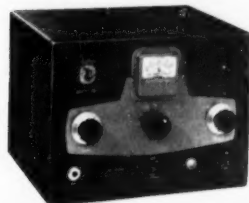


VIKING RANGER

Desk-top beauty in a self-contained rig. Designed to serve as a transmitter or an RF and audio exciter for high power equipment, the Ranger represents the absolute in compact transmitter operation and convenience. Phone input 65 watts, CW input 75 watts. Covers all amateur bands from 10 to 160 meters. Built-in, extremely stable VFO, or may be crystal controlled. Pi-network antenna load matching from 50 to 500-ohms—no internal changes needed to switch from transmitter to exciter operation.

Cat. No. 240-161—Viking Ranger Kit, less tubes, crystals, key and mike. **\$179.50**

Cat. No. 240-161-2—Viking Ranger, wired and tested, less tubes, crystals, key and mike. **\$258.00**



VIKING "ADVENTURER"

Big transmitter features in a new compact CW kit. Single-knob bandswitching 80 through 10 meters. Rated at 50 watts input and effectively TVI suppressed, the "Adventurer" is engineered throughout for easy assembly and operation by novice or experienced amateur with a minimum of equipment wiring and operating experience. Self-contained power supply is wired for use as an "extra" station power source when transmitter is not in use. Clean, crisp break-in keying.

Cat. No. 240-181-1—Viking "Adventurer" Kit, with tubes, less crystals and key. **\$54.95**

Amateur Net.



VIKING II

Make every day seem like Christmas with the famous Viking II. 180 watts CW input, 150 watts phone. Completely bandswitching and self-contained, the Viking II is professional in appearance and design. TVI suppressed—all stages metered—covers amateur bands from 10 to 160 meters. Owned and operated with pride by thousands of amateurs everywhere, it's the perfect choice this Christmas season or any season.

Cat. No. 240-102—Viking II Transmitter Kit. Complete with tubes, less crystals, key and mike. **\$279.50**

Cat. No. 240-102-2—Viking II wired and tested with tubes, less crystals, key and mike. **\$337.00**

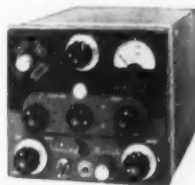
Amateur Net.

VIKING MOBILE

The "most wanted" mobile transmitter among discriminating amateurs, the Viking Mobile is easy to load and its powerful audio system packs that extra punch for sure mobile communication. Gang-tuned and bandswitching, it covers 75, 40, 20, 15 and 10-11 meters. May be wired for 6 or 12 volt operation—under-dash mounting—all controls readily accessible. Dynamotor power supply and external VFO for steering post mounting also available.

Cat. No. 240-141—Viking Mobile Kit, less tubes, crystals, microphone, power supply, accessories. **\$99.50**

Amateur Net.



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has acquired a 2½-kw. portable generator. AQZ has a new Viking Ranger. LBJ is working on a new 500-watt rig for all bands. DRB reports for the Olathe gang. His vertical ground plane works out FB. HCV also has a ground-plane antenna. DLE has mobile in the car now and also has built a rig for the high school where he is a math teacher. ZEH has a new Collins 32V-3. ECD, reporting for the Eldorado group, says SBL has a new Globe Champion. TDW operates mobile most of the time. ONI had his mobile whip stolen from the car. HFE is attending Wichita U. FTW is attending radio school in Kansas City. GQM has just finished a Viking II. UAT now has an RME-45 receiver. ONF, of Howard, plans to run code sessions on 75 meters soon. MOX, active on 2 meters from Lawrence, hears the Kansas City boys working 8s, 9s, and 10s. MOX is modifying his 75A-1 for coax input for his converter. VFF and WRC are two new 2-meter stations in Kansas City. KKF, of Topeka, is on 2 meters with Millen HFS using his Viking power supply and modulator to quite an advantage. The SeKan Radio Club picnic held Sept. 12th was well attended and all had a good time. Traffic: W0FDL 647, BLI 496, NIY 246, OHJ 80, WGM 63, FEO 35, GCJ 34, TOL 28, ABJ 21, FDJ 21, NFX 18, SVE 16, ONF 12, VBQ 12, DEL 11, ONC 10, ICV 8, KFS 8, TNA 8, YFE 8, LOW 7, MLG 6, QMU 6, FHT 5, QGG 5, BET 4, ECD 3, IFR 3, LBJ 3, LIX 3, UAT 3, MKG 2, NLV 2.

MISSOURI — SCM, Clarence L. Arundale, W0GBJ — SEC: VRF, PAM: BVL, RMs: OUD and QXO. The SMARC held its annual picnic in Springfield on Sept. 5th and a large crowd attended. A group of Kansas City 75-meter hams held a covered-dish picnic Sept. 24th at Harrisonville. A number of Kansas City mobile stations assisted in communications for the sports car races held early in September. VRF reports that LRU has been appointed Radio Officer in RACES and will be assisted by UBR, NDS, WHK, CBS, and VRF. CPI returned from his vacation in time to earn another BPL certificate. GAR and QXO again qualify for BPL. GAR finally got his bad interference cleared up so he can keep all his schedules now. K0FBO installed a 250TL in the BC-610E and now can run up to 950 watts input. The Rolla Amateur Radio Club has purchased a Viking I for its club station. BUL and his XYL recently had a bad car accident. HUL while on an extended vacation trip to the West Coast, has kept a home schedule with EBE. We hear HUI is bringing a new Viking Ranger home with him. TCF has added a Heathkit VFO to his TBS-50D and also has received his General Class ticket. BUL now is the official Net Manager of the Missouri Emergency Phone Net. RTW had to replace the transformer in his S-40B. VFP is on the air with a Globe Scout and an S-40. SAK has received his Conditional Class ticket. Traffic: (Sept.) W0CPI 604, QXO 599, GAR 504, GBJ 112, ZLN 75, K0FBO 62, W0LUS 60, BZK 43, KIK 37, KA 35, EBE 22, OUD 19, ZWI 10, BUL 8, QBX 7, HUI 5, CKQ 4, RCV 4, SAK 4, EEE 3, CXE 2, QWB 2, TCF 2, LQC 1. (Aug.) K0FBO 132, W0BUL 5, BVL 3.

NEBRASKA — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, 8VYX. SEC: DDJ, TQD is working mobile, phone and c.w. RDN reports the new frequency for the Nebraska C.W. Net is 36.5 mc. BDR and his XYL recently visited RDN. The Tri-City Radio Club has elected VQR, pres., and QKR, vice-pres. CDL, VQR, and QKR are members of the Licensing Committee. W0VIC is a new member of the Tri-City Club. BDQ and his XYL, of Lincoln, visited RDN while moving to Denver. W0SPD is on 2 meters with Harvey Wells and VHF-152. UOV and UOW, out North Platte way, have dropped the "N" from their calls. WNs at North Platte are: ULN, UTQ, VUB, WLO, and VEA. The North Platte Novice Net will be held Mon. at 6:30 p.m. with VUB as NCS and ULN as alternate. The frequency is 3735 kc. IJK is on a.s.b. and hoping for more power. IBA has a new Heathkit VFO and Globe Scout. EWK has a new Globe Scout. RIG is on with a 4-65 A. PDJ and OMH, of Hastings, are both using Viking IIs. ARFC membership blanks are available from the SCM so let's get in those requests. FQB attended the International Municipal Signal Assn. Convention at Atlantic City. Traffic: (Sept.) W0TQD 2118, K0AIR 1774, W0ZJF 354, RDN 212, FQB 194, MGC 87, AFM 47, KDW 46, FTQ 36, MAO 27, VYX 25, HTA 18, PDJ 14, LEF 12, BEA 11, ERM 11, HQN 10, KFX 8, QHG 7, ORW 6, K0WBF 4, W0NHT 3, PQP 3, CBH 2, DJU 2, LRB 2, LRK 2, RML 2, RRH 2, THX 2, AIN 1, EGQ 1. (Aug.) W0RDN 99.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM: LWW, RM: KYQ, CN and MCN: 3640 kc. CPN: 3880 kc. CEN: 29,580 kc. EOB is active again on CN and renewed ORS appointment. New Novices at ARRL Hq. include CIE, CJI, CIM, and CLC among the YLs and CHs and CKZ among the OMs. UGG is at M.I.F. as a freshman, while his Dad, UJG, continues to work on 144 and 220 Mc. LIG again furnishes information on the Fairfield County gang, which is much appreciated by your SCM. WMI and YVP are Bridgeport firemen. UKY seeks QSOs on 160 meters. ZLJ now is General Class on 40 and 80 meters. UAD moved to Devon and TYT to Woodmont. (Continued on page 92)

K6AFL
K6ANN
K6BAS
K6BCM
K6BJ
W6AY
W6BAX
W6BET
W6BMU
W6CBN
W6CEO
W6CHE
W6DJI
W6DUW
W6DVB
W6DWM
W6FBR
W6FKS
W6FYM
W6HB

W6HHN
W6INJ
W6JFV
W6KEV
W6KFQ
W6KM
W6LOX
W6MUC
W6NBD
W6NGP
W6ODT
W6OHU
W6OMC
W6ONQ
W6OS
W6PUB

W6QIT
W6QQV
W6RWI
W6RXW
W6SC
W6SCZ
W6TVS
W6TXT
W6UF
W6UFU

W6UOV
W6UUR
W6VQD
W6VW
W6VYH
W6WC
W6WSL

W6YSX
W6ZGV
W6ZLB
W6ZPH
W7SLC
W0JC/6
WTKNP

W2CN
W2KSP
W2QA
W4AGD
W7ESK
W4TO
W6QD

W6ENV
W6JBC
W9AIO
W9DZY
W0NWN
W0RPE
W0AZT





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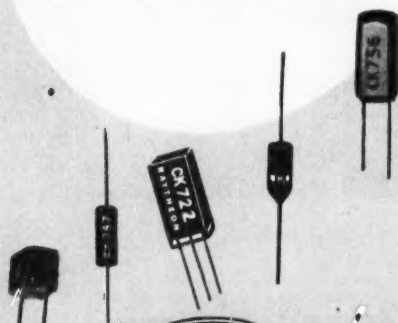
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NUCLEONIC TUBES

RECEIVING AND PICTURE TUBES • MICROWAVE TUBES

RMZ is active mobile on 2, 10, 20, and 75 meters. SJO was washed out by Hurricane Carol. KML has 250 watts on 20 and 40 meters. VJG lost his beam to Hurricane Edna. Ten-meter mobile operators from Connecticut gathered at Bridgeport Sept. 30th to exchange ideas with a similar group at Fort Jefferson. L. L. YQR is gaining fame on the faculty of the U. of Bridgeport. NFG reports on c.d. activity in the Hamden-New Haven Area. BGP worked G5DQ with 10 watts on 40 meters and reports fine participation by Stratford hams during the hurricanes. YAZ, ZTY, ZZU, and ZNU are now General Class. FYG reports on Meriden hurricane activities. TZP went off to M.I.T. after completing the new receiver. NLM renewed EC and OES and ABZ renewed EC appointments. LHE hopes to regain his traffic status at the new QTH. YNC has a new antenna and 200 watts on 40 meters. BFS added 10-meter vertical to his antenna farm. MLT is portable at Block Island and usually on 3880 kc. OBS skeds are being kept by GIX and TD regularly. Thanks to all who sent in reports of c.d. and AREC activities during the hurricanes. Activity at WNI has been curtailed for school. The CN/CPN joint meeting on Sept. 25th was very successful. UIZ furnished the only OES report. Connecticut had many participants in the V.H.F. Contest. RAN is a freshman at W.P.I. UIZ worked Ohio, West Virginia, and Kentucky on 2 meters, which gives him 14 states plus VE1. RWD now is completely s.s.b. and praises it highly. Traffic: (Sept.) W1WNI 306, CUH 184, KYQ 126, FBH 139, LIG 116, BGP 144, BPL 90, OPZ 67, RGB 60, BVB 55, HYF 44, GIX 32, HUM 32, YYM 31, QJM 23, LV 20, MLT 20, UED 20, KV 15, FTM 12, BDI 11, BFS 4, YNC 3. (Aug.) W1LIG 105, UGW 61, QJM 18, FTM 17, RAN 7.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK, PAM; WRZ, RM; OHT. The Pine Tree Net meets Mon. through Fri. at 7 p.m. on 3562 kc.; the Barnard Net Mon. through Sat. at 7:30 a.m. and the Sea Gull Net Mon. through Fri. at 5 p.m., both on 3960 kc. Your SCM was very sorry to receive the resignation of BTY as PAM. Your new PAM is WRZ. Hap has had a lot of experience as the founder and chief woodtick of the Barnyard Net. With a bit of help from us he will do a good job on the Sea Gull Net, too. No sooner had Hurricane Carol gone than Edna blew in. The Maine gang was ready for her. BPL, pres. SEC, had all stations alerted and standing by well in advance of Edna's visit. In connection with the above, your SCM has a new chimney. LHA and HZE are going s.s.b., LHA plans to use a gallon. BPI and SDW called on AFT. PTL has returned after mobiling across the U. S. to Seattle. Welcome to WNICEV, of Augusta. The Boothbay Radio Club's "Hamback" was rained out by the hurricanes. The rumor that the AMRs will winter in Florida. Your SCM would like to hear from you c.w. operators. Let's have the dope on your station, your activities, etc. Season's Greetings to all. Traffic: W1LKP 158, BPI 109, WTG 72, YYW 45, ZBN 37, UDD 32, BX 28, LVR 25, RSC 17, BTY 16, NIQ 16, BAD 14, NXX 11, VYE 10, LHA 6, SNE 4, UZR 4, VEH 4, EFR 2, FKH 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, Jr., W1ALP — The following counties make up the Eastern Massachusetts section: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, and Suffolk. New appointments: ZBD Hudson, WCI Newburyport as ECs; W1W as OO Class IV. Appointments endorsed: IAP Lexington, VYS Weston, IO Danvers, LJT Region 6 of Mass. C.D., BKR Westford, Littleton, Tyngsboro, as ECs; MEG as OES; BHD as OES; HWE as OES. TWK is on 2 and 10, BRK is on 2, ALV is on 10, WFW is on 75 meters. AR also has the call AWF. AJU moved to Quincy. OT has TBS-50 mobile. AQI has General Class license. New Novices: CAR Dorchester, CAF Brockton, CDR Lexington. ZOP is new in Framingham. New officers of the El Ray Radio Club are RND, pres.; BOD, vice-pres.; WYX, secy.; ZOY, treas.; CAS, act. mgr.; AQF, chief engineer. WNIBPW is a new ham in Whitman. WGM is secretary of the Wellesley Amateur Radio Society, TKZ. WNICEF is new in Chelmsford. His father is AMQ and he is on 80-meter c.w. The South Shore Radio Club held its first regular meeting with a talk by WK. Meetings are held the 1st and 3rd Fri. at the Quincy YMCA. SZV is secretary. ALP has a Viking II transmitter. The following Beverly hams helped out during our two hurricanes on 144-Mc. mobile: NF, GGV, TYP, LIU, DWY, TAD, NAR, and JPS. BND is on with an Elmac AF-67. VMD is having trouble with the rig. YAL, formerly of Needham, now is K4ABL in Virginia. 20LH wants skeds with Barnstable, Dukes, and Nantucket Counties for his WANE certificate. New officers of the Framingham Radio Club are SQY, pres.; HJP, vice-pres.; W1J, secy.; ZBN, treas.; MHC, act. mgr.; AQF, chief engineer. During the storms: MEG, WPW, QQW, WMT, LPM, and RVA. MEG has a new NC-183D. Among those active during the second storm were MHC, SQY, W1J, JUL, SRG, and MQU. LQQ, Hamilton EC, was on with TIN and YLQ mobile. AVY/1 and WKM handled lots of traffic during the storms. SS and UPZ kept the press informed of the course of the storms. WPW, in his a Gonset Commander and a Super Six on 10 and 75 meters. QIT has a new QTH in Quisset. UBC is going back to W.P.I. CTR visited his old club at Framingham. Radio Amateur Open House met at the Cambridge YMCA and Mr. Doorakian, of the FCC,

(Continued on page 94)

MALLORY HAM BULLETIN

How a peanut can "knock out" an Electrolytic Capacitor

Believe it or not, a salted peanut is one of the worst enemies of electrolytic capacitors. Just a few grains of salt on an assembler's hand—left over from a mid-afternoon snack of peanuts—would be enough to ruin a whole production lot of capacitors.

Mallory engineers, investigating potential sources of trouble in the manufacture of electrolytics, have found that extreme care must be exercised to avoid any contamination by chloride salts. Only *one part in a million* of chlorides is enough to shorten the life of a capacitor seriously. Not only the salt from peanuts, but even the traces of chlorides present in a worker's fingerprint must be strictly eliminated from chance introduction into the manufacturing operations.

As a matter of fact, the making of Mallory electrolytics demands far cleaner working conditions than you would find in a hospital. All employees in Mallory's capacitor plant are not permitted to handle or even touch capacitor raw materials or capacitor cartridges with their bare hands. They use rubber or cotton gloves which are regularly cleaned and changed, to avoid possible contamination. And



they observe what may seem to the casual visitor to be extreme precautions in every phase of assembly.

The result of this full-time vigilance on the production line is exceptionally high standards of life and performance of Mallory capacitors in their intended service. On a great many small details such as these is built the reputation that Mallory electrolytics have gained in years of use by radio experimenters, service men and electronic manufacturers.

Whether you buy electrolytic capacitors for your own radio gear . . . or whether you buy for someone else . . . you can be sure of this:

NO OTHER ELECTROLYTIC CAPACITOR IS MADE WITH GREATER CARE THAN MALLORY ELECTROLYTICS

In addition to the highest standard of purity, Mallory capacitors also give you the exclusive Fabricated Plate anode construction, which permits 475 volt operation at 85° C. without derating. Serious amateur experimenters find it pays to specify Mallory every time they need electrolytics. Your local Mallory distributor carries a complete stock and can give you prompt service.

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2-Meter Beam Kits

GOTHAM proudly presents a 6 element Yagi beam for 2 meters at only \$9.95. Contains a 12 foot boom, 1" alum. tubing, 3/4" alum. tubing for elements, Amphenol fittings; all hardware, and instructions. Vertical or horizontal polarization, terrific performance!

And GOTHAM'S new 12 element Yagi for 2 meters at only \$16.95! Contains a 12 foot boom, 1" alum. alloy tubing, 3/4" tubing for elements; all Amphenol fittings; all hardware, and instructions. Vertical or horizontal polarization, multiplies your power by 32!

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S105T • Std. 10m 3-El. T match, \$18.95. 1—8' Boom, 1/2" Alum. Tubing; 3—6' Center Elements, 1/2" Alum. Tubing; 6—6' End Inserts, 1/2" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

D105T • De-Luxe 10m 3-El. T match, \$25.95. 1—8' Boom, 1/2" Alum. Tubing; 3—6' Center Elements, 1/2" Alum. Tubing; 6—6' End Inserts, 1/2" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

S104T • Std. 10m 4-El. T match, \$24.95. 1—12' Boom, 1/2" Alum. Tubing; 4—6' Center Elements, 1/2" Alum. Tubing; 8—6' End Inserts, 1/2" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

D104T • De-Luxe 10m 4-El. T match, \$30.95. 1—12' Boom, 1/2" Alum. Tubing; 4—6' Center Elements, 1/2" Alum. Tubing; 8—6' End Inserts, 1/2" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

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D152T • De-Luxe 15m 3-El. T match, \$39.95. 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 2—5' End Inserts, 1/2" Alum. Tubing; 2—6' End Inserts, 1/2" Alum. Tubing; 2—7' End Inserts, 1/2" Alum. Tubing; 1—T Match (6'), Polystyrene Tubing; 1—Beam Mount.

20 M. BEAMS

S202N • Std. 20m 2-El. (No T), \$21.95. 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 1/2" Alum. Tubing; 1—Beam Mount.

S202T • Std. 20m 2-El. T match, \$24.95. 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 1/2" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

D202N • De-Luxe 20m 2-El. (No T), \$31.95. 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 1/2" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

D202T • De-Luxe 20m 2-El. T match, \$34.95. 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 1/2" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

S204N • Std. 20m 3-El. (No T), \$44.95. 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 1/2" Alum. Tubing; 1—Beam Mount.

S204T • Std. 20m 3-El. T match, \$37.95. 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 1/2" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

D204N • De-Luxe 20m 3-El. (No T), \$46.95. 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 1/2" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

D204T • De-Luxe 20m 3-El. T match, \$49.95. 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 1/2" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

was the speaker, with music by QIU and his XYL. TON was chairman. WLZ is on 40 and 80 meters. The Satuit Amateur Radio Club of Scrutante and the Wayland Radio Club are now affiliated with the ARRL. CYL is living in Penbrooke. HWB has been very ill again. 78AB/1 has a 522 ready to go on 2 meters. LN, Radio Officer for Danvers, reports the following were mobile on 2 meters during the storm: EMN, HVN, IO, LN, NUH, PIM, WMM, VVY. With a 522 in the Public Works Hq. and a gas generator to act as NCS, YQF operated this station. AVY reports the following helped out during storms: WGN, CTZ, LAZ, HPH, TZU, BMQ, ULD, ZPE, WL, AWL, MHN, AGG, AEN, OH, Jerry Mullen, and Edgar Connor. 2VNG/1 has a rig in the car on 75 meters. LLY, Arlington EC, reports LXR, THO, WBX, LLY, CTW, OEX, and AUQ helped out during the storm. Mobile on 6 meters were BAQ, CTW, FWQ, LLY, LXR, NBI, THO, VCZ, WYC, and WBX. IAP, Lexington EC, reports WQH, ADP, AGN, PIU, TLD, WAE, TWG, SNR, PEX, MSP, ZPY, and ZNG were active during the storm. HSY, Bedford, reports YFP, ZSG, ZHN, TCG, NAD, SAP, NDI, OG, UHV, VGC, DTA, and ACE were on during the storms. ALP, Quincy EC, reports that IA was on the air at City Hall during the storms and ZWQ, YJG, HGJ, ACR, WFQ, WLW, WK, VJC, and YVE were in touch with all of the towns that were on. MSH, Winthrop, kept all the nets up to date on the weather reports from Logan airport. TOI moved to Readville. HB, Winthrop EC, says these hams were on helping out: MQB, DJ, CMW, OIR, OUC, HEJ/M, BB, BDU, AGB/M, BOX, TTH, PBX. The Falmouth Radio Club held a meeting. NFE moved to Foxboro. DVS has a B&W 400 transmitter. The Club has started a training course for newcomers with LYN, DVS, and TJW helping out. Traffic: (Sept.) W1AVY/1 609, UKO 337, LYL 261, WKM 209, QRP 32, SS 32, WPW 20, BY 17, QLT 16, TV 8, WAI 7, UBC 6, WU 6, BB 4, CTR 2 (Aug). W1QPU 30, CTR 10.

WESTERN MASSACHUSETTS—SCM, Roger E. Corey, W1YH—RM: BVR. WMN meets at 7 p.m. EST Mon. through Fri. on 3590 kc. Western Massachusetts is made up of the following counties: Berkshire, Franklin, Hampden, Hampshire, and Worcester. All others are in the Eastern Massachusetts section. The Northbridge High Radio Club, ZPJ, is on the air from its new location with an HQ-140 and a Navy surplus ATD transmitter. BIV is trustee and YHU is chief student operator. WEI is a student in his first year at Emerson College. DBM and ICP gave the ARRL TVI talk and demonstration for the Hampden County Radio Club. FWJ has moved to Agawam from Pittsfield as has BXB from New Jersey. 5TPZ/1 is stationed at Fort Devens and makes his home in Groton. YXV is up to 30 countries and picked up HB1MX/HF for a goody on 40-meter c.w. RVG, MKD, AGM, and MNG report their AREC organizations were alerted during Hurricane Edna. JRA expects to broadcast the Official Bulletins on tape this season. Watch later columns for schedules. UKR attended the YLRL picnic at Shenandoah National Park. JYH is now the proud owner of a Collins 310B exciter. The s.b.b. gang is growing daily, with KK, WJ, LFL, CGY, QWJ, TTL, JYH, and BBT active on 75 meters. QWJ is having good luck with a single 4/125A on 20 meters. ARH is a new ORS appointee. AVK is getting world-wide 89 reports with his new three-element 20-meter beam. RDR is now in his new QTH but finds that building a home single-handed limits his on-the-air time. KFY has WANE and Worked Vermont awards. TTL has a new Johnson Ranger and an HRO-7. Traffic: W1UKR 329, K2CBI/1 168, W1HVR 130, TVJ 80, WCG 76, SRM 66, MNG 45, RR 38, HIRV 25, ARD 23, WCC 21, TAY 20, YXV 19, JRA 15, TZA 9, JYH 7, WEF 7, UV1 4, OBQ 1.

NEW HAMPSHIRE—SCM, Carroll A. Currier, W1GMH—SEC: BXU. RM: CRW. PAM: AXL. Asst. RM: TBS. Your SCM now has a new QTH on the same street but at No. 1531. The question of the day is, how did you survive the Hurricane Edna? The New Hampshire boys in the various emergency nets went into action early in the morning and worked diligently until the emergency was declared over. Almost every city and hamlet was represented and a great job was done by all. WUU has a 500-watt rig with 813c on the air. SGD has new 10-meter beam. YVK is much interested in verticals and has them in use. Those in the first group of Novices examined by the Manchester Radio Club were successful in getting their licenses. KYG and his XYL, QJY, are back in Manchester and are renewing old acquaintances on the air. QJX and her OM had a fine trip to Nova Scotia. Many old-timers will miss HXE, who has passed on to Silent Keys. He sure liked 2 meters and was always ready for a ragchew. Our sympathy to his family. I wish the new SCM all the best, and many thanks for your response during my term. Traffic: (Sept.) W1CDX 110, COC 90, WUU 74, GMH 55, FZ 10. (Aug.) W1COC 35, CGU 7.

VERMONT—SCM, Robert L. Scott, W1RNA—SEC: SIO. PAM: RPR. RM: OAK. Nets: Phone GMN, 3860 kc., Mon. through Fri., 1200-1300; VTFF, Sun., 3860 kc., at 0930. VTN, 3520 kc., Mon. through Fri., 1900; c.d., alternate Sun. 1000 hours, on 3993 and 3501.5 kc. NLO's XYL, Helen, now is WNICKO. BJP's shack is now off the kitchen. Fellows taking part in the c.d. aviation test received letters

(Continued on page 96)

HERE'S YOUR KEY TO SSB



Single Sideband Generator

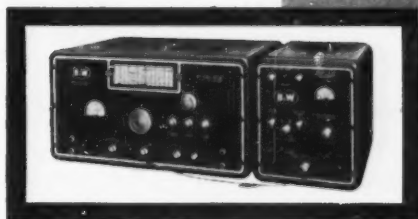
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Single sideband transmission, with its superior effectiveness over AM and its elimination of heterodyne interference, is yours with B&W's new Single Sideband Generator, Model 51SB. Used with the B&W Model 5100 Transmitter, this generator offers you:

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- Voice control operation on SSB
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The Model 51SB Single Sideband Generator converts a B&W Model 5100 into a band-switching single-sideband suppressed-carrier transmitter—with all the advantages of SSB plus the AM and CW features already built into your Model 5100. Its construction is completely unitized. Equipment removes easily and disassembles into three major sub-assemblies: the R-F Unit, the Audio Unit, and the Main Chassis Unit.

Factory wired and tested, the 51SB comes to you complete with tubes—all set to convert your Model 5100 Transmitter to SSB. This combination provides a superlative driver for any high-powered linear amplifier! Write for descriptive Bulletin 51SB.



Information regarding the application of the Model 51SB Single Sideband Generator to other composite transmitters having certain required characteristics will be made available in the near future. Send name and address for Bulletin 51SB.

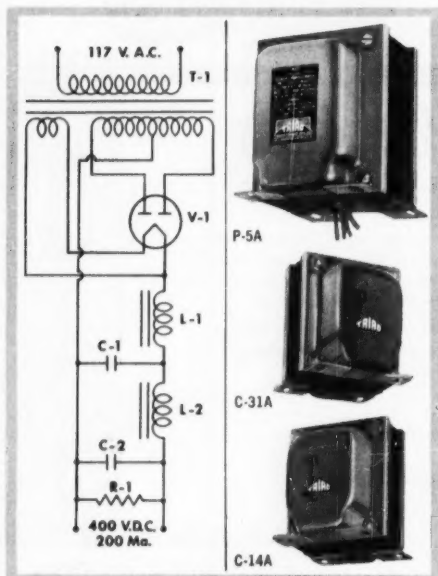
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This power supply is ideally suited for transmitters operated under Novice class licenses. When higher R.F. power is added later on, this supply may be used as a modulator power supply.



Symbol	Triad Type No.	List Price	Characteristics
T-1	P-5A	16.75	1100V CT Output: 400V DC @250Ma 5V @ 4A Fil.
L-1	C-31A	8.20	25/5 H @ 20/200Ma DC 150 ohms 1500V Test
L-2	C-14A	5.85	6H @ 200Ma DC 150 ohms 1500V Test

Additional components required as follows:

C-1 2 mfd 600V Oil filled	C-2 4 mfd 600V Oil filled
If the above values are used, Ripple will not exceed 1.5%	
R-1 20,000 ohms, 25 watt wire wound	V-1 5R4GY or 5U4G

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of appreciation from Governor Emerson for their contribution of personal time and use of the station. Stations reporting traffic are a very small minority of those heard. Those interested in AREC, please contact your local EC or the SEC. SIO. Traffic: WIRNA 129, OAK 126, SIO 124, AVP 90, VZE 26, VVO 22, IT 12.

NORTHWESTERN DIVISION

ALASKA—SCM, Dave A. Fulton, KL7AGU—PDG is leaving the Territory and soon will be back in W1-Land. Kodiak reports a new Novice, WL7BGD, and he is looking for contacts on the 40- and 80-meter Novice bands. ALJ is back in Kodiak and should be on the air soon with a Viking. BCT is looking for an Anchorage and Fairbanks traffic outlet, phone or c.w. How about it, some of you c.w. experts? We could use a good c.w. net in the Territory. The Kodiak Amateur Radio Club is setting up a Novice station for the Novice members of the Club. DG is busy working on a homestead in Kodiak. He says it is an ideal spot for a radio station. A sharp earthquake at 1:18 a.m. Oct. 3rd shook a lot of Anchorage homes out of bed, judging by the activity on the 75-meter band at about 1:30 a.m. Damage and casualties were light so there was no emergency, but the gang was there just in case. AWR and AYZ arranged for the air rescue of a Nunivak woman via ham radio.

IDAHO—SCM, Alan K. Ross, W7IWU—Emmett: TYG is now editor of the *Hambone*, official organ of the FARM Net. Five Net Controls were chosen, one for each night of the week. MRS remains as Net Mgr. Sessions are at 6:30 p.m. M.T. now. Rupert: VIL has a new c.w. membership in the AREC. Lewiston: IFG built a Heathkit VFO. TLV is driving a new Buick with Morrow converter and Elmac transmitter installed therein. OWA attended a ham picnic in Walla Walla. AOO took the Elmac and NC-57 with him on a mountain vacation trip. CTT is working at Atomic Works, Hanford, Wash. IDZ has to resign from the EC post for the time being. Kellogg: RQG is a new ORE. PTI had to resign as EC because he is attending school in Oregon. Boise: It's very lonesome on the GEM Net (c.w.), 3638 kc., Mon., Wed., and Fri., at 8:00 p.m. MST. All the rest of you appointees, please drop me a line. Traffic: W7NH 154, RQG 84.

MONTANA—SCM, Leslie E. Crouter, W7CT—New officers of the Harlo Radio Club of Harlowton are TGL, pres.; INM, vice-pres.; OOV, secy.-treas.; and NPV, acting mgr. OOV and NPV contacted Kurt Carlson on the *Flying Enterprise II*. RDM operates mobile only. TTC is modulating an 807. LBK and KGI keep busy with TV servicing. The Montana State C.W. Net meets every Tue.; Thurs.; and Sun. at 1900 MST on 3520 kc. The Montana Phone Net meets every Mon., Wed., and Fri. at 1730 MST on 3910 kc. The FARM Net meets every Mon., Wed., and Fri. at 1900 MST on 3935 kc. The Montana Breakfast Club meets at 0715 MST on 3910 kc. These nets have a purpose. Working with one or more of them helps you to learn how to operate and organize in case of an emergency. You owe it to yourself and to the general public to know what to do when needed. Recent renewals or appointments: KUH as SEC, FUB and LBK as ORS, NPV and LBK as EC. If you are reading this you are interested in what is going on in Montana and we are interested in what you know, so let's have some news. Please send in your activity report. Traffic: W7CT 6, LBK 5.

OREGON—SCM, John M. Carroll, W7BUS—The teen-agers in the Oregon-Washington Area are starting a teen-agers net. Send applications to ULU. UMA is on 20 meters. EDU is moving to Seaside. Cascade Net officers are LRT, mgr.; QWZ, asst. mgr.; HUI, dir.; AEF, asst. dir.; and FWL, secy.-recorder. WAT now is in W7-Land looking for a job. The Oregon Slow Net has been changed to the Oregon State Net. Applications are received for membership by AJN. VIL really is active in the traffic nets. ISP and HSY are new ECs. FUN is a school teacher. VKA is in W8-Land getting a new car. LY is now on active duty with the Navy in New York. WN7WLY is a member of the OARS. The OARS's new officers are QWZ, pres.; QWZ, vicep.; RUN, secy.; QEI, treas.; VCH and PON sent applications to MARS. CZ is building a new house. RLG is putting a new room on his QTH with the aid of a book on carpentry. The Dipsey Net is becoming active again on 3940 kc. AZP and his house trailer have moved into Eastern Oregon for the hunting season. NFC still is hunting contacts on 6 meters. UQQ is back at the university. Traffic and news notes about BC's after the 10th of the month, too late to be in that month's news. Traffic: (Sept.) W7APF 450, WAT 93, AJN 65, TBT 57, THX 44, QEI 20, PRA 15, ESJ 12, EDU 8, PHJ 8. (Aug.) W7THX 39, PHJ 16, WAT 11, KTL 6, ESJ 3.

WASHINGTON—SCM, Victor S. Gish, W7FIX—FWD and FWR celebrated their Golden Wedding Anniversary on Sept. 14th and received a flood of congratulations from their host of friends, both by mail and on the air. OE is rebuilding the shack and gear for the traffic season. RXH took over as WSN Manager on Armistice Day. UQY submitted an OO report and an imposing list of 40-meter DX with all Grahamsland stations worked. CZY mobiled through Glacier, Yellowstone, and Teton Parks. ETO made two vacation trips but now is back home ready for traffic. V.h.f.

(Continued on page 106)

USE RME

FOR BETTER QSO'S

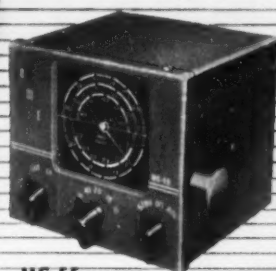
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MC-55 FIVE BAND MOBILE CONVERTER

For 10, 15, 20, 40 and 80 meters. 1.25 micro-volt sensitivity on all bands. Edge-lighted dial. 25-to-1 worm gear tuning. ANL. Transmit-receive switch. Three gang tuning capacitor. Individual coils for each band. Aperiodic i.f. stage aids in providing high-gain characteristic. Input impedance 50-72 ohms. Output frequency 1550 kc. 150-180 v. at 18 ma. 6 or 12-volt operation. Tube lineup: 6BJ6 r.f. amp; 12AT7 osc-det; 6BJ6 i.f. amp; 6AL5 noise limiter. Dark gray. Size: 4 1/4" high, 5 1/4" wide, 5 1/4" deep. Shpg. wt. 7 lbs. **Amateur Net. \$69.50**

MC-53 VHF THREE BAND MOBILE CONVERTER

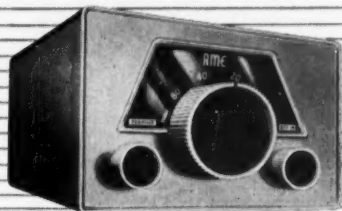
Designed for 2, 6 and 10-11 meters. 1.25 micro-volt sensitivity on all bands. 25-to-1 worm gear tuning. Individual coils for each band and each circuit. Three gang tuning. Aperiodic i.f. stage aids in providing high gain characteristic. Separate input connectors for each band. Send-receive switch. ANL. VR provides excellent stability. 6-volt operation. 150-180 v. at 25 ma. Output frequency 1550 kc. 6AK5 r.f. amplifier; 12AT7 osc-det; 6BJ6 i.f.; 6AL5 limiter and OB2 voltage regulator. Gray enamel. Size: 5 1/4" wide, 4 1/4" high, 5 1/4" deep. Shpg. wt. 7 lbs. **Amateur Net. \$66.60**



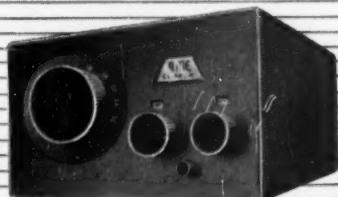
MC-55



MC-53



DB-23



RME-100

DB-23 PRESELECTOR

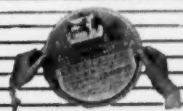
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Peak limiting pre-amplifier provides higher articulation and intelligibility to combat QRM and QRN. Ideal for use with Johnson Viking, Collins 32V and all ham-built equipment. Clipping level adjustable from 3-20db. Pi low-pass filter provides high suppression of generated harmonics above 3000 cps, concentrating voice power to most effective band of frequencies. Response 200-3000 cps. If set to provide 100% modulation, louder speech will not over-modulate. Front panel input for Hi-Z microphone accommodates PTT circuit. Tube lineup: 6SC7, 6H6 and 6X5GT rectifier. With power supply in blue-gray steel cabinet. Size: 5" high, 7 1/4" wide, 6" deep. Shpg. wt. 9 lbs. **Amateur Net. \$39.50**

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Folded dipole amateur antennas 300 ohm (kilowatt
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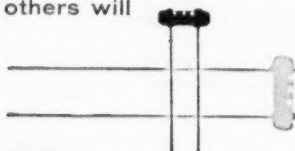
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(Continued from page 96)
activity is on the upswing in the section after an interesting talk by 1H1Q. The Spokane Amateur Radio Club meets the 1st and 3rd Tue. of each month at Manito Park. Officers are GBU, pres.; EHH, vice-pres.; PCV, secy.-treas. The Clark County Amateur Radio Club (Vancouver) meets the 1st and 3rd Wed. in the Red Cross Bldg., 1310 East 10th, Vancouver. Officers: SAP, pres.; LVH, secy.; KJN, treas. The Sound Traffic Net resumed operation Oct. 1st on 28.6 Mc, at 1900 PST and will meet Mon., Wed., and Fri. for the time being. JPH is on 75-meter mobile. S. J. is using a modulator for the big rig. WSN reopened the 1988-kw. c.w. section Oct. 11th, 1930 PST Mon. through Fri. The WARTS meets on 3970 kc. at 1800 PST daily. BA put "torque guys" on his 95-ft. tower with the 130-lb. beam on top. CBE is about ready for RTTY. PHO has a new beam on 20 meters. 4ESK now is 7ESK. TIQ is installing a new antenna. TGO has a vertical for 20 and 40 meters. HKA has orders from the doctor to take a rest from radio. BG's big antenna is down. AMC has been hunting and rebuilding the house. HDT is preparing the RACES plan for Asotin County. FM is on 20-meter mobile. KKY moved to Idaho. The Walla Walla Valley Radio Amateur Club, Inc., reports the club house is practically finished. Club officers are GVC, pres.; RCS, vice-pres.; NSL, secy.-treas. and J. Club meets Mon. at the club house off Milton Highway 3 miles southeast of Walla Walla. The Valley Amateur Radio Club, Inc., meets the 1st and 3rd Fri. at Puyallup Memorial Bldg. on Meridian North. Officers: JJK, pres.; MCU, vice-pres.; OEB, secy.; UZE, TGO, sgt.-at-arms; HMQ, pub. Traffic: (Sept.) W7BA 1151, PGY 844, SFN 556, FRU 531, USO 156, HKA 126, OE 85, FIX 50, OEB 46, RXH 46, FWD 40, ZU 39, AIB 37, TGO 53, VCE 25, ADS 15, JEV, KT 8, AMC 5, BG 3, TIQ 1. (Aug.) W7RXH 55, ETO 9.

PACIFIC DIVISION

NEVADA — SCM, Ray T. Warner, W7JU — ECs; PEW, TJY, ZT, OPS; JUO, UPS, ORS; MVP, PEW, VTC, OBS; BVZ, PEW is the newly-appointed EC for Elko County. LGS, of Boulder City, has settled down in Reno. JLN is active again with an ART-13 from his Paradise Valley ranch. HJ's daughter received the call SNP. As Nevada's only active YL, she should be popular. 6QHL now is 7WTR. RSY, of Las Vegas, handled emergency CAA flight traffic when a long lines telephone cable was broken recently. K7FJB makes BPL agreements with a traffic officer of 721. KOA resigned as EC but remains an active Emergency Corps member. The Southern Nevada Amateur Radio Club (SNARC) held its annual picnic at Mount Charleston this year. It was well attended by members and their families. Traffic: K7FDB 721, W7JU 11, BVZ 3, VIU 3.

SANTA CLARA VALLEY — SCM, Roy L. Couzin, W6LZL — Well, fellows, this is my last report and I wish to take the opportunity to say I have enjoyed working with you and I hope the many friends I have made during my two terms as SCM will keep in contact with me. It is with regret that I give up the job, but I honestly believe WGO, your new SCM, will do a real job if you will give him the kind of support he needs to put the section on the map. I want to thank the ever-faithful gang who made a real effort to get an activity report to me the first of the month, and to the clubs who sent their papers or notices to me for meeting information. I hope you go right on sending these to your new SCM as he will appreciate them also. HC has been elected a chairman of the Pacific Area Staff (PAS), and also has been appointed director and asst. mgr. of TCC. EXX reports the new 14-Mc. rig is almost complete and he is designing equipment for 50 and 420 Mc. and rebuilding a low-frequency rig. YHM is back from KL7-Land. He got in some air time while up north and operated from a helicopter. Best DX was a G5 on 7 Mc., 25 watts c.w. WLI reports participation in the F.M.T., and that he received his 25-w.p.m. sticker. BAM reports Europe and Africa are needed for WAC and 5 more states are needed for WAS. MMG reports he was active on 14 Mc. on Mt. San Bruno during the V.H.F. Contest. The SCCARA put up a booth at the Santa Clara County Fair. It was well planned and the help needed to set up the booth and man it was offered, but the booth was so far set aside from the main center of interest very few people saw it. Traffic: W6UTY 150, YHM 94, HC 64, K6BAM 28, BBD 8, W6IMG 5.

EAST BAY — SCM, Guy Plag, W6RLB — Asst. SCM; MXQ for v.h.f. activity and RVC for TVI work. RMs: IPW, JOH, PAM; LL, ECs: CAN, CX, FLT, QDE, TCU, ZZF, and the newest, K6ERR, who handles the Berkeley-Albany-EI Cerrito Area. Lee also is a new OES. QZE represented the Walnut Creek Area, and RTA was Acting Emergency Coordinator for the Oakland Radio Club, assisted by DDT, UTX, K6AUD, and K6CCQ, during the Simulated Emergency Test. The Vallejo gang operated under ZZF, and CAN represented Napa. The gang up that way furnished communication to the Silver Lake Boy Scout camp during the summer. ATM, ZZF, DTB, QEA, and IZU kept skeeds with NQJ, LRT, and LL to let the boys keep in touch with home. The Vallejo gang did a swell job of furnishing communications at the Mare Island Centennial celebration. TWI is a new Emergency Corps member. Brentwood. JKW has joined in Centerville. BXE is new

(Continued on page 102)



Worth waiting for!

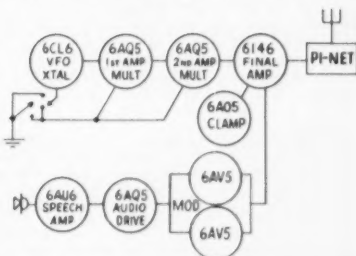
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We have a Morse printer which will accept dots and dashes of the Morse code and deliver typewritten copy. This printer will loaf along at 120 words per minute on very poor circuits whereas ordinary teleprinters employing five unit code require good circuits and operate normally about 60 words per minute. All of this equipment, available here in Littleton, is sure to bring about a more widespread use of Morse code.

We have devised methods and equipment for teaching Morse code faster than had ever been thought possible. The methods are the result of a lifetime of experience of fine telegraph and wireless operators. The student will receive words and sentences (on our selection of certain letters of the alphabet for roll No. 1) — within hours, instead of days or weeks.

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We were the originators of inked slip and photo-tube keyers at the time when there was no other method of providing low cost practice material. Those photo-tube keyers did a good job, but there is no longer any need for them. Our Morse keyboard perforators and our Morse reperforators make it possible to supply Morse perforated slip at a cost lower than the inked tapes and you have real commercial communications equipment throughout.

I would be grateful for any comment any of you may be so kind as to make. If you are a beginner we can make of you a good operator fast. If you are now an operator we can make of you a much better operator faster than you had ever dreamed. If you are a very fine operator we can make you still better.

AND FINALLY — We are more interested in developing good Morse operators for this new commercial equipment of ours than we are in any kind of a school job. I do hope, therefore, that schools and clubs will ask me for this information as well as individuals. This is the kind of equipment that will make it possible for you to toss into the junk heap any photo-tube keyers, which at best have been a substitute for the real thing. Write to me, won't you?

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LITTLETON, MASSACHUSETTS
(Ted McElroy)

OBS. Listen for him on 3870 kc., Mon., Wed., and Fri. at 0700 and Mon., Wed., and Sat. at 1900. The Central California Radio Council has set up a license plate committee to press for renewal of our temporary privilege. ACN is chairman, with CTH, LOZ, and Mrs. GGC on the committee. A Northern California RTTY Society has been organized and meets the 3rd Thurs. of each month at 909 Fallon Street, Oakland. 11HJQ addressed the Oakland Radio Club when he was out here for the V.H.F. Hamboree. Over 200 attended the Hamboree. K6BAO's "whirling dervish" topped first place in the hidden transmitter hunt, with K6ORR as co-pilot. Not only does BAO have the gadget to end all gadgets on hidden transmitter hunts, but he runs a 4X150A on 420-Mc. mobile, and is well under way in constructing a 420-Mc. repeater station. The team of K6AXN and K6BAT is active on 420-Mc. mobile and OHQ has talked to Vollmer Peak on 420-Mc. mobile with his plug-in converter for the Gonset Communicator all the way from Auburn and Sacramento. K6DJS and CAX are now General Class. New hams are K6HRL, KN6HEJ, KN6HTP, and KN6GBZ. AAQ is leaving for the Orient and BDF is going to Seattle. Ex-9UN now is K6GK. W6TWN and K6AUC are putting up a repeater. ACN is working up a kw. a.s.c. rig. BYD plans to bandswitch with selayns. BYJ works great DX with only 8 watts. PAZ had a lot of explaining to do when he switched to a.s.c. Traffic: (Sept.) K6FDG 1354, BDF 195, W6OPY 175, K6WAY 163, W6EFD 49, JOH 47, AKB 34, HBF 9, LIL 4. (Aug.) K6BDF 163, GK 105, W6EFD 37, ITH 29.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC, SEC NL, WB was guest speaker at the September meeting of the San Francisco Radio Club and spoke on "Pi Network." The HAMS and the San Francisco Shipyard Club held a joint picnic and all enjoyed a steak dinner. The Naval Shipyard Club invited the XYs to join them every second meeting night of the month. The Humboldt Radio Club entertained two visiting Japanese hams at its last meeting and in return for their hospitality gave a tour through the Japanese boat and viewed the radio gear. SLX, from Eureka, attended the Hamboree at San Mateo. The Mobiles will handle communications for the Nevada Days at Carson City as usual this year. The 29ers held its annual breakfast with a good attendance. The Teletype Club held its first breakfast the same Sunday as the 29ers. At the Marin Amateur Radio Club meeting LTC, Larkspur, told of an interesting experience which he had in the PU was presented with a medal for 80-meter Field Day loading. K6BU won a 2-meter converter. MIY, Mill Valley, is a new member of the Club. At the SCRA LOU, Santa Rosa, has taken over the job of getting the boys of the Mission Trail Net a meeting place for the get-together next season. ACN reports that up to June 6040 hams have applied for the special plates for mobiles. BYS has resigned as EC. Bill stated that his health would not allow the extra time needed on this assignment. Sorry to lose such a good helper and I would like to take this opportunity of thanking him for a job well done. UOQ has accepted this assignment. Tony Gomes is another good helper. GQA now is using an ART-13. Ten teletypes are almost ready for the airwaves locally. Ed Tilton's 2-meter talk was enjoyed by all. After the Hamboree many attended the dinner in his honor. The Ladies Radio Club in San Francisco started a c.w. round table Thurs. at 1 P.M. All Novices are invited to join in on 3725 kc. IKO got stuck in the Nevada Desert and could hear the boys but had no transmitter mobile. MXV is back to work after an injury. DEK refused the nomination as president of the SFRC because of ill health. ATO and GGC also refused nomination as each had held the office for two terms and thought that was long enough for one man to hold that office. CBE is active on 20- and 40-meter 'phone. Congratulations to SWP, PHT, and QMO on making BPL in September. A surprise c.d. drill in the Bay Area found 2 and 10 meters very active. Amateurs came through with flying colors and news reports showed the drill was very successful. C.d. is looking for more 10-meter mobiles. Traffic: W6SWP 889, PHT 869, QMO 651, GCV 44, GGC 19, MWF 16, GQA 4.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — With the Sacramento Valley Section Meeting coming up we hope to have a great many more appointments in the section so, fellows, come prepared to accept one soon. In the south we have the Sacramento Club doing fine with code classes and c.d. checks. GPF worked like to have a general ragchew, or rather a discussion on how to better the traffic and other amateur necessities. This would bring us closer together and our many problems could be ironed out, thereby we probably could come up with something real good. We will sure talk this over during our section meet. ZF still is on low power but gets out very well. K6EDK is in the traffic run and hope he does much better in the coming months. F6W has a vertical and worked AYL, 20 miles away, while New York stations were booming in. ZWAT, ex-6IEO, sends a letter and extends his 73 to all the gang in W6-Land. SHH is keeping his Official Bulletins going out very fine. REF still is doing very fine as net control for the Mission Trail C.W. Net and also has a good traffic count each month. DDC has just returned from a vacation which took in the southern part of the State where he visited a large number of amateurs. K6HY is a new ham in MI.

(Continued on page 104)

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The CD-2 is a combined 2 meter crystal controlled transmitter and double conversion super heterodyne receiver. It is designed for CD fixed and emergency operations, and is engineered to meet all the rigid specifications of the FCDA. The CD-2 is a rugged, quality constructed unit, dependable for the serious work of CD—ideal for just pleasant QSO'ing on two. Compare these fine outstanding features:

- 110 VAC AND 6 VDC OPERATION
- RCVR SENSITIVITY: 0.5 MICROVOLTS
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- PROVISIONS FOR COMPLETE REMOTE CONTROL
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A complete resume available on request to CD Division

SONAR RADIO CORP
3050 WEST 21st ST., B'KLYN, N. Y.

For BALANCED Tone at any Listening Level



IRC HI-FI
VOLUME CONTROL
Type LC1

You can have full range of the audio spectrum at any listening level with this IRC high fidelity volume control. It automatically boosts 'highs' and 'lows' as you decrease the volume. Continuous compensation gives you full depth of tone and clean brilliance even at whisper level.

This is a continuously variable Hi-Fi Control and should not be confused with tapped or stepped type loudness controls. Many quality audio sets now include this unit. You, or your serviceman, can quickly install one in your set by simply replacing your present volume control.

List price is \$9.95. Order from your IRC electronic parts distributor, or send coupon for literature.

Wherever the Circuit Says



**INTERNATIONAL
RESISTANCE CO.**

Dept. H, 401 N. Broad St., Phila., Pa.

Please send bulletin describing
Type LC1 Hi-Fi Volume Control.

Name

Address

City

State

Shasta, Calif. Keep those activity reports coming! Traffic: W6REF 402, MWR 22, JDN 5, K6ED 14.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: EBL RM: K6BGM, PAMS: ZRJ, WJF. The Stockton Club played host to ATO, who gave a very informative speech. DBH and RRN got a write-up in the Stockton newspaper by saving the life of a critically injured truck driver. GQZ and BCL both achieved a fine score in the V.H.F. Contest, both on 6 and 2 meters. QUE has been appointed by the Stockton Club to give Novice exams, and is being kept quite busy. EXH still is under the doctor's care but is in excellent shape. The Merced Club put on a demonstration of ham radio for the Merced Junior Chamber of Commerce. Those participating were K6DUU, W6BY Y, W6ZRI, W6YWH, and K6BGM. Fixed-station-to-mobile communication was demonstrated, also messages were sent via the National Traffic System. K6EKS is leaving the Air Force and the Merced Area. Ben plans to settle in the Los Angeles Area. K6DUU and W6ZRI make up the new TVI committee in Merced. KN6HFA received his ticket in September and now reports he has worked 16 states with a Heathkit AT-1. K6NAT is the USNR station at Merced and is looking for traffic on Tue. nights. WJF has a 54-foot mast and 3-wire doublet constructed, and now has the problem of erecting them. Traffic: (Sept.) K6FAE 530, W6ZRI 500, TTX 126, SJJ 67, FEA 42, WJF 22, EBL 17. (Aug.) K6FAE 508.

ROANOKE DIVISION

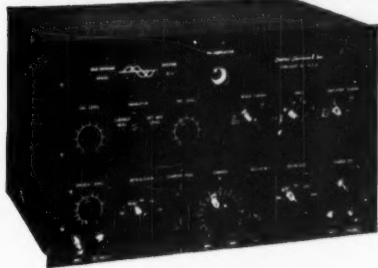
(See Roanoke QSO Party Announcement, Page 106)

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — AKC is handling traffic from Rock Hill and reports into the traffic nets at least twice a week. MVX has a new jr. operator born Sept. 26th. FFH is active on MARS nets and the South Carolina Phone Net. WN4HGW has an HA-129 and Heathkit transmitter. ZIZ reports in the Early Bird Net and expects to be a regular on 4RN soon. GQE and 88TV are Navy hams currently stationed in Charleston and will be on the air soon. Few activity reports for September were received. More activity reports are needed from this section. Others are interested in your activities, so keep the SCM informed of your activities monthly. Traffic: W4AKC 365, ZIZ 88, FFH 76, FM 7, ANK 4.

VIRGINIA — SCM, John Carl Morgan, W4KX — All Virginia section nets are back on full winter schedule. All are invited to participate. Thanks to TYC, UHG, YZC, and IF, who led in keeping VN rolling during the summer. TYC, newly-appointed RM, is roll-keeper of VN. Congrats to JG, who celebrated 50 years on the air September 19th. The Harrisonburg Area gang threw a big surprise shindig in Tom's honor, and the SCM understands several of them did some fancy "jamming" to keep the cat from escaping the bag beforehand. The Tidewater Mobile Club handled communications for the International Yacht Regatta, with mobiles in pits and afloat and NCS at Yacht Club Hq. Those participating were DHZ, PWX, YVG, RGZ, ULL, PAK, IPA, LW, RRA, MLD, RRA, SVY, JZQ, and 9GLR. TMRC also started a Novice School. Irony Dept. QCW, VZQ, and HBC, while operating as KC4AB on Navassa Is., tried to raise the big DXer, HQN, who was on 75-meter mobile, but Bill "unheard" em — gulp. HGP now is DL4SK. VZH is moving to Georgia. K4ABL, in Staunton, is ex-1YAL from Massachusetts. HJK, now in Arlington, is ex-3NOE. TFX reports college work at GWU will curtail his hamming, so pappy 1A will come out of mothballs to keep the family on the air. LW continues to publish the outstanding Virginia Section Bulletin. If you're not on the mailing list you're missing a lot. Drop LW a line. The SVARC is about ready to break ground for a new club house. And speaking of clubs, about the most active club station around is PCC, of the Roanoke Club. VYZ has a new 20-meter beam to play with — another good traffic man gone wrong. Congrats to MWH, who is starting his second term as our Division Director. He's YOUR voice in League affairs. If you have any suggestions or gripes he's ready to listen. Traffic: W4PFC 390, BLR 117, SVG 64, AKN 61, DWP 45, TFZ 38, VYZ 38, IF 56, YVG 34, CKI 30, OWV 15, VZH 13, KN 11, LW 10, UHG 6, YOL 6, TFX 2.

WEST VIRGINIA — SCM, Albert H. Hix, W6PQQ — SEC: YPR, PAM: FGL, RM: DFC, AUJ, GBF, HZA. New hams in this State are WN8TGT, WN8TGS (daughter of PZT), WN8SNG (son of BOK), WN8SNF, SXE, PQF, WN8TFD, WN8TIG, and WN8TJV. MUJ has returned to Princeton. WN8SSA, a new ham in Charleston, worked 23 states on 80 meters in five weeks. W8IDH (son of HZA) now is General Class. The following hams are away at school: ISA, JBA, MBA, and MEF. DFC's daughter is beginning to pick up around his way. 9EHQ, formally of Fairmont, visited the MARA recently. PZT and AUJ attended the October gabfest held by MARA at Starkey Restaurant near Bridgeport. The SJARC, in Weston, is conducting two code classes per week. WVN lost a very consistent NCS when MBA left for college. The Ground Observer Corps has completed quite an extensive observation tower on a hill-top near Weston. The Blennerhassett Club had an election of officers in August. The Club meets at the YMCA every other Fri. evening at 7:30 P.M. NQW

(Continued on page 106)



MODEL 20A

MULTIPHASE EQUIPMENT is the overwhelming choice of SSB OPS everywhere. Ask any ham who uses it! Listen to it perform on SSB, AM, PM or CW!

MODEL 20A

- 20 Watts Peak Output SSB, AM, PM and CW
 - Completely Bandswitched 160 thru 10 Meters
 - Magic Eye Carrier Null and Peak Modulation Indicator
- Choice of grey table model, grey or black wrinkle finish rack model.
 Wired and tested..... \$249.50
 Complete kit..... \$199.50

**SIDE BAND SLICER
MODEL A
IMPROVES ANY RECEIVER**

Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts ORM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.
 Wired and tested..... \$74.50
 Complete kit..... \$49.50

**Check These Features
NOW IN BOTH MODELS**

- **Perfect Voice-Controlled Break-in on SSB, AM, PM.**
- **Upper or Lower Sideband** at the flip of a switch.
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
- **New Calibrate Circuit.** Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- **New AF Input Jack.** For oscillator or phone patch.
- **CW Break-in Operation.**
- **New Gold Contact Voice Control Relay.** Extra contacts for muting receiver, operating relays, etc.
- **Accessory Power Socket.** Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
- **40 DB or More Suppression** of unwanted sideband.

EVERYBODY WANTS MULTIPHASE EQUIPMENT

and for good reason. It's versatile, permits all-band operation 10 thru 160, it's extremely stable and it's a well engineered, dependable piece of communications equipment.



**MODEL 10B
SUCCESSOR TO THE POPULAR
MODEL 10A**

- 10 Watts Peak Output SSB, AM, PM and CW
 - Multiband Operation using plug-in coils
- Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.
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QT-1 ANTI-TRIP UNIT

Perfect Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.
 Wired and tested, with tube.... \$12.50

AP-1 ADAPTER

Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.
 Wired and tested, with tube.... \$8.50

NEW AP-2 ADAPTER

Combined AP-1 and atal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One atal suffices for most receivers. \$17.50

WRITE FOR LITERATURE

**MULTIPHASE
EQUIPMENT**

Central Electronics, Inc.

1247 W. Belmont Ave.

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Watch For Early Announcement Of The New Deluxe MULTIPHASE VFO.

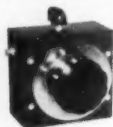
LOOK



Single Sideband X-4 SSB EXCITER

Only 6" x 6" x 6", 10 watts peak output. Same type crystal filter used in SS-75. Output frequency 3.6 to 4 MC. Provision for VFO input or crystal operation. Power required:

6.3 V., 1.6 A., 200-300 V.D.C., 80 MA., 45 V. bias. Wired, tested, aligned..... **\$69.50**



ELENCO X-4 VFO

Only 4" x 4" x 2". Modified Clapp circuit, very stable, finest components. Plugs into X-4 Exciter, tunes 3.6 to 4 MC. Upper or lower sideband selection. Wired, tested..... **\$24.50**

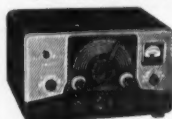


VOICE CONTROL

For voice control of X-4 Exciter and your receiver. Only 4" x 4" x 2". Power required 6.3V 6A., 200-300 VDC 10 MA. Wired and tested..... **\$19.95**

X-4 Mixer, one band, 40 or 20 meters **\$19.95**
Power Supply for operation of all X-4 equipment..... **\$49.50**

Johnson Viking "RANGER"



Viking RANGER Kit, with all parts, assembly and operating manuals, less tubes..... **\$179.50**

Kit of tubes..... **\$23.00**

Factory wired RANGER, tested and ready to go, with full instructions, less tubes..... **\$258.00**



8/8/8 MFD. 500 V. D.C.

Triple 8 mfd. 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically sealed, 5" x 3 3/4" x 2 1/4"..... **\$1.95**



PHOSPHOR BRONZE AERIAL

125 ft. of the finest aerial wire obtainable 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire. Regular list \$4.95..... **90¢**

All prices F.O.B. Cincinnati
20% deposit on C.O.D. orders

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FIRST ANNUAL ROANOKE DIVISION QSO PARTY

December 11-12, 1954

A QSO Party open to amateurs in the Roanoke Division will be held from noon EST December 11th to 6 p.m. EST December 12th. All amateurs in North Carolina, South Carolina, Virginia and West Virginia are urged to participate.

Rules: 1) The object is to contact as many fellow Roanoke Divisioners in as many different counties as possible during the contest period. 2) There are no restrictions as to power, band, mode, or hours of operating, and cross-band and c.w.-to-phone contacts are permissible. Each station may be worked but once regardless of band or mode. 3) The general call will be "CQ RD" on c.w. and "CQ Roanoke Division" on phone. 4) Information to be exchanged in each QSO will consist of the number of contact, your call, RS or RST report, your county and state (if located in an independent town or city use nearest county), your name. Example: NR 3 W4ACY 589X GUILFORD NC PHIL. 5) Scoring: Novices — all contacts whether with W or WN count 5 points for each message sent and 5 points for each message received for possible total of 10 points per QSO. Others — 1 point for message sent and 1 point for each received for possible total of 2 points for each W-to-W QSO; 5 points for each Novice message sent and 5 points for each Novice message received for a possible 10 points for each W-to-WN QSO. Bonus QSO Points — 25 points before multiplier for each of the six elected ARRL officials (Director, Vice-Director and 4 SCMs) contacted. Multiplier — Multiply total QSO points as determined above by the number of different counties worked to determine final score. 6) Suggested frequencies: 1810, 3680-3750, 3800-3850, 7150-7200, 7200-7250, 14,100, 21,300, 28,900-29,000 kc. 7) The highest scoring W and WN in each section will be awarded an attractive memento. 8) All stations taking part to any degree are urged to submit their logs before January 15, 1955 to Owens Hutcheson, W8DFC, Chairman Awards Committee, P. O. Box 587, Princeton, W. Va.

Here's a chance to meet the gang in your division. Get on the air December 11th and 12th and see how many you can work!

has a new Viking II transmitter. AUJ has agreed to act as NCS for the C.W. Net. The Princeton Club is sponsoring a low-speed Novice net on 3725 kc. PQQ visited 3GHD, LVE, GHM, CTJ, KT, BES, CGS, and K2EDL (all members of the Frankfort Radio Club) in Sept. Traffic: (Sept.) W8AUJ 109, DFC 23. (Aug.) W8RRD 5, W8SQWU 2

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Bruggeman, W0CDX — SEC: MMT. This session of the Legislature is the one which considers new bills, so it will be our last chance for two years to get our license plate legislation through. Our state-wide amateur representation is large enough so that we can contact all the Legislature members and put through our bill. Let's all contact at least one Senator and Representative, both personally and by letter, so that they know us and what we can do. IC is spear-heading the drive and has prepared the letters. The El Paso Radio Club handled the communications for the annual Pikes Peak hill climb again this year with TV at the starting line with stand-by equipment, WPK and SDW as NCS. Participating were SIW, ANX, IHR, PHN, MJD, CCG, CVG, MFE, QXN, JMB, MEY, PTR, VCZ, WPK, HEM, EYN, TV, K2IMC / 0, and W5BTI / 0. HOP has moved to Monte Vista from Minature, Nebr. LO is the new president of the Denver Radio Club. NIT and daughter, NCB, visited KQD and her OM at Alamosa. KQD is new RM and also Radio Officer for San Luis Valley. IA is Colorado MARS NCS. Schedules are 1920 Mon. on 3280 kc., 2100 Tue. on 2220 kc. APK's final is rebuilt Collins style with an 813. NVX reports a joint meeting of the La Junta and Lamar Radio Clubs. Both clubs are working on ARRL affiliation. Traffic: K0FDX 1625, W0KQD 153, K0WBB 52, W0NVX 37, APK 22, HOP 17, IA 7.

UTAH — SCM, Floyd L. Hinslaw, W7UTM — QWH is a new OBS and Class III OO. Visitors in September were 6WT and his XYL on the 10th and K6BMM and XYL on the 30th. Very enjoyable in-person QSOs were had with both. K6BMM is planning to make this his QTH when his service days are finished. PIM, in Salt Lake City, works 40- and 80-meter traffic and sent me his report this month. More reports are requested to better list the activities of

(Continued on page 108)

Amateurs and Experimenters

ONE DAY SERVICE / 2000 KC to 54 MC



ONE-DAY Processing

Orders for less than five crystals will be processed and shipped in one day. Orders received on Monday thru Thursday will be shipped the day following receipt of the order. Orders received on Friday will be shipped the following Monday.

International TYPE FA-9

(fits same socket as FT-243)

Pin Spacing .486 Pin Diameter .093

RANGE (kc)	TOLERANCE	PRICE
Fundamental Crystals		
2000-9999	.01%	\$2.80
10000-15000	.01%	\$3.90
Overtone Crystals (For 3rd overtone operation)		
15 MC- 29.99 MC	.01%	\$2.80
30 MC- 54 MC	.01%	\$3.90

SPOT FREQUENCY

.01% TOLERANCE—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency when operated into a 32 mmf load capacitance.

HOW TO ORDER

In order to give the fastest possible service, crystals are sold direct and are not handled by any jobber. Where cash accompanies the order, International will prepay the Air Mail postage; otherwise, shipment will be made C.O.D. Specify your exact frequency and the crystal will be calibrated to .01% or better of this frequency with the unit operating into a 32 mmf load capacitance.

International Crystal Mfg. Co., Inc.
18 North Lee
Oklahoma City, Okla.

DEPT. Y

Price

Please Send: _____ Crystals Freq. _____
 _____ Crystals Freq. _____
 _____ Crystals Freq. _____
 TOTAL \$ _____

TO: Name: _____
 Address: _____
 City _____ Zone: _____ State: _____

Enclosed: ☐ Check, ☐ Cash, ☐ M.O. for \$ _____, or
 Ship C.O.D. ☐

International/CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1165
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HOW TO SWITCH OVER TO SINGLE SIDEBAND



by Bill Cummings, W1RMG

Our early start in Single Sideband transmission has given us a long lead in the field. You get these three big advantages when you switch over to SSB via the Dale route: **1.** We can deliver immediately from the most complete stock of SSB rigs. **2.** Dale's trade-in allowance will help you swing the deal. **3.** You can pay on easy Dale terms. Why wait, when you can enjoy SSB right now!

CENTRAL ELECTRONICS **NEW!****\$249.50**

MODEL 20A MULTIPHASE SSB EXCITER

20 watts peak output — SSB, AM, PM, CW.
Has great new performance features *plus* all the time-proven characteristics of popular Model 10A.

MODEL 10B MULTIPHASE EXCITER \$179.50

10 watts peak output — SSB, AM, PM, CW.

SIDEBAND SLICER **\$74.50**

An SSB adapter that will improve any receiver.

Some Advantages of SSB Transmission

1. Harmonic TVI virtually eliminated through the use of linear amplifiers.
2. No high power modulator and modulator power supply required.
3. SSB eliminates the heterodyning carriers that plague the overcrowded phone bands.
4. Round-table operation of two independent QSOs on the same suppressed carrier freq. using opposite sidebands.

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5PRUE 7-5555

hams in this section. Now with fall weather, business is picking up on the mobile frequency, 3935 kc., and so is the QRM. UTM's shack is surrounded by a forest of TV antennas but no reports of TVI — just ITV. NMK has sold his mobile rig so is restricted to fixed operations for awhile. Traffic: (Sept.) WPIM 67, UTM 3, (Aug.) W7CCC 12.

SOUTHEASTERN DIVISION

ALABAMA - SCM, Joe A. Shannon, W4MI - PAM: RNX, RN: KIX. New appointments: ZSP (Trussville) as EC, SUF as OO-II, CAH as OO-III. The Anniston Club reports activity zooming on 10-meter mobiles and hopes have a total of eight soon. We welcome the following new licensees in the section: K9N, Joe A. O., and K9N, Ed. Thum, both in the effort of the AAQ, W4NHHV, and W4NHHX, a family affair (father and two sons), in Brent. 50NL/1 says that his AREC organization is rapidly taking shape in Auburn with a large assist from 8XS. Asst. EC, in Opelika. W4W reports the Mobile Club is holding a new meeting in the new building at the old site and into a new home and added new 32V-3 and 75A-3. He is now at 800 feet elevation. WOG is going strong with new mobile while OBV continues having trouble with his. ZGE has a new jr. operator. EJZ and VOM gradually are getting back in the groove. TXO has converted link transmitter to 10 meters. W4W reports the Mobile Club is holding a new meeting in the new building at the old site and into a new home should be ready soon. Net activity in both AENP and AENP is increasing with cool weather. Traffic: (Sent) W4WOG 156, KIX 150, EJZ 44, YRO 41, ZSG 33, TXO 28, YAI 26, BFM 16, DNB 10, TKL 8, OAO 7, ZGS 3, 3. (Aug.) W4PPE 65, AAN 28, BFM 10, OAO 2.

EASTERN FLORIDA—SCM, John W. Hollister, jr., WA4VW—Two excellent bulletins are Vol. 1, No. 1, on the Palmetto Net (FN) from Net Mgr. LAP and Vol. 1, No. 1, on the Novice Hurricane Net from Net Mgr. YJE. FT, Lauderdale: 144-Mc. interest is high. FNR demonstrates it. ZQZ is the club code instructor. Club attendance averages 30 at each summer meeting. IM celebrated his 24th wedding anniversary. Bird Sparks: HCRT was at the Flamingo Bar-B-Que; VCH visited an NE Florida Sea Sumner mobile. News: MMJ, JYB, and JN, Clewiston. Comments: GOM, KJL, PJU, who used 28 stations. Jacksonville: VMF is test-pocketed on 20 meters. HWA went to California and back. The JARS licensing examining committee is doing FB work. Key West: DRT is ground-plane on 10 and 20 meters. Lakeland: SVB reports the passing of DIN in Tampa. Lake City: YNM is doing extra well with AREC and now has a "Columbia Radio Amateur Pool" of 23 members in the high school club with FB help from the Naval Reserve for training. Melbourne: BWR is back with 2-kw emergency power. Miami: IYT vacationed in Nassau. DRC plans road signs announcing the club meeting dates and time. The club has started new code and theory classes. St. Petersburg: Spark Gap; WME will handle code classes. JOU is handling arrangements for the ARRL Southeastern Division Convention to be held next June. Sebring: WN4EGH is now emergency powered. Nees: NHHN key classes are BKC, EGB, and SDR. FN NCNCs are: W6O, SXV, OZC, and ATA. News: WB, FB, and B, Ft. Pierce. Comments: RPT, JYB, EPT, NPD, 60W, DVR, PJU, and DRD made the BPL Traffic: WD4WR 703, LAP 298, DRD 193, WEO 117, TRN 60, ZIR 38, LMT 32, IYT 26, SVB 26, RWM 19, FSS 16, AYD 5, FWZ 5, DRT 4, TJU 4, WEM 3.

WESTERN FLORIDA — SCM, EDWARD Collins, W8M/RE — SEC. PLE, ECs: HIZ, MFY, K1AL1 is the station call of the Pensacola Amateur Radio Club. K1A1F is the club call of Pensacola High School. It has an active membership of 100 members. The new two-way radio K14AAGM is a YL in Pensy High. UUF continues to work 14-Mc. DX, ZFL has an FB vertical antenna. YRF is working on a modulator. DAO/DEF keeps the club humming. HIZ is looking for a DL applicant. QKQ moves from 7-Mc. to 14-Mc. QUS is busy. Dargy, K1A1F hopes to have more time for 7-Mc. c.w. QK is getting on 75 meters with a pair of 813s. HJA wants s.b. for his B&W transmitter. 9CPI 4 also is enjoying his B&W rig. W4N1HJ and W4L14 are working more power. HIZ is having trouble with the HT-9. FKM is moving his mobile to 14-Mc. putting the club rig in shape. MS has s.b. exiting good and is studying linear amplifiers. DOB, BBU, UYS, BGO and ZUN are active in the high school radio club. BGG wants a 75-meter antenna. CY is almost exclusively 14-Mc. K1A1F is working on a B&W rig. BFB and K1A1F "party line" Sun. a.m. PLE plans to visit clubs in the section for emergency net work. SIW wants a 10-meter converter. UNV, KWM, MFY, SRX, RKH, VEY, CAJ, and UDF are participating in EARS scheduled emergency

GEORGIA — SCM, George W. Parker, W4NS — SEC: OPE, PAMs: LXE, ACH, RMtS: MTS, OCG, Nets: Georgia Cracker Emergency Net, 3995 kc, at 0830 Sun, and 1900 Tue, and Thurs; Georgia State Net, 3570 kc, at 1900 Mon., Wed., and Fri.; Atlanta C.W., 7150 kc., 2100 Sun. The meeting of the South Georgia Rag Chewers Net held at Albany, Ga. Sept. 26th was attended by 110 hungry hams and XYLs. A good time and a fine barbecue was enjoyed.

(Continued on page 110)

New
**UHF & VHF
LEAD-IN**

Thousands of separately sealed tiny cells, filled with inert gas, make this waterproof cable stable and efficient electrically.

ADVANTAGES:

- 1 Lowest losses at UHF and VHF frequencies.
- 2 Great abrasion resistance and mechanical strength.
- 3 No time-consuming end seal required; easy to install.
- 4 No internal moisture to cause signal loss.
- 5 No kinking when used with antenna rotors.
- 6 Resistant to snow, ice, rain, and wind.
- 7 Resistant to ultraviolet rays from the sun.
- 8 Uses Belden Weldohm conductor for long conductor life.
- 9 Can be clamped tightly in stand-off insulators without crushing. No special fittings required.
- 10 Conductor spacing is constant even when the lead-in is transposed.
- 11 No stripping problem for attaching the conductor.

...Cuts
SIGNAL LOSS

This heavy wall of brown virgin polyethylene protects the cable against mechanical abuse and damage from ultraviolet sun rays.

This completely new 300-ohm line results from the development of a new cellular plastic core where each separate cell is filled with an inert gas to make an efficient cable with the lowest possible losses at both UHF and VHF frequencies. With absolutely waterproof cable, no sealing of the ends is necessary. Cellulene cable can be fixed in stand-off insulators without crushing. The thick outer wall of polyethylene serves to protect the cable from abrasion and sun damage.

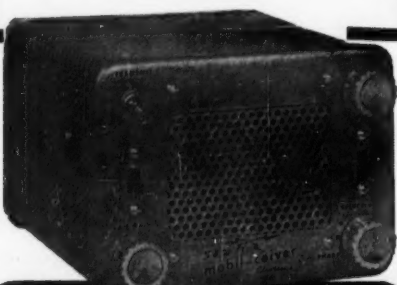
By fusing *only* virgin polyethylene, the wall can be made smooth—absolutely free from rough spots—to prevent the adherence of dust and other impurities which would increase the losses.

The copper-covered steel strands, which make up the conductors, assure 49% greater resistance to breaking from flexing or stretching than any all-copper conductor.

8275 CELLULINE[®]
TRANSMISSION LINE

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WIREMAKER FOR INDUSTRY

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by all. New officers of the SGRCN are WRT, net control; RHH, alt. net control; PGK secy.-treas.; OHL, business mgr. BXV now is on 20 meters in Quitman. WRY is net control for the Kennebec Emergency Net. FZO, in Jackson, has a new Globe Scout on the air. CFJ is building a TV transmitter. ZUF has a new beam for 10 meters. YEK (YL) now is s.s.b. IMQ, in Cedartown, is set to go on emergency power with a 2-kw. generator. UMJ underwent surgery on his eyes. KFL has an acute case of matrimony. PGV and CKN are now s.s.b. The Athens, Cedar Valley, and Bell System Clubs now are affiliated with the League. AREC organization in this section is growing daily. If you are not now a member you are invited to contact your EC, SEC, or SCM. Traffic: K4WAR 526, FCI 433, W4OCG 115, IMQ 86, ZWT 40, BWD 36, MA 20, MTS 20, NS 16, ZD 9. **WEST INDIES**—SCM, William Werner, KP4DJ. SEC: HZ, ZD, Ramey AFB, registered in the AREC. National Guard station WAC received new Globe Champion transmitter and NC-125 receiver. CX is Radio Officer of the Air National Guard. FI and ZK have a daily sked on 3960 kc, so that ZK can talk to son PZ. WR's receiver is being repaired by CL. DV is assembling a pre-fab aluminum shack. GP is back on 75 meters. RD is building an 813 transmitter. KV4AA air-conditioned the shack. MP is C.D. Comm. Officer. JZ operates mobile with Elmac transmitter and receiver. WV and WY have B&W transmitters. NY repaired 75-meter folded dipole. RD has a Heathkit VFO. ZY has a 20-meter Mini-beam. HM put up a folded dipole for 3925 kc. QV bought a 500-watt transmitter from RC. RC is using TB850. WP4AB is now KP4. W2CZU/KP4 is now KP4AAO. WS relayed weather reports from USWB office in Ponce to ES on 2 meters for relay to San Juan on 75. OS, Aguadilla EC, reports five full and one supporting AREC member with one mobile unit and one emergency unit available at Aguadilla. The local net frequency is 3960 kc. The P.R. Emergency Net was alerted twice during September at the request of USWB because of torrential rains and flood threat. MV received a letter of appreciation from USWB. The Antilles Net, with TO as NCS, provides USWB with two weather reports daily from islands between KP4 and VP4. WT, Mayaguez, and YX, San Juan, keep housewife guard on 3925 kc. Net frequency all day. WX is in Ft. Bliss, Tex. W8EMN is in Waverly, Iowa. CA is putting up 100-ft. tower for TV antennas. New officers of A&M Arts College RC are FI, pres.; PZ, RW, CO, and DG, directors. ZW is on 14,070 kc. at 2130Z daily looking for traffic for the Caribbean Area and is arranging traffic skeds to Europe, N. Africa, Turkey, etc. ZW's XYL is ZV. Traffic: KP4ZW 329, RK 7, DJ 4, ID 2, RC 2, ES 1.

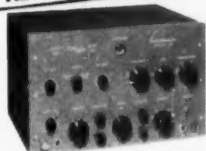
SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Howard C. Bellman, W6YVJ — News of the month is the excellent job done by the LSN gang in bringing about the "new" Southern California Net, which has acted like a shot in the arm for c.w. traffic. CMN, BHG, and GJP are heading the show in SCN. Radio clubs have sent in reports like mad, including bulletins created by members. K6CUX, Upland College Club, is a new ARRL affiliate. The San Gabriel Valley RC meets Tue. at 8 p.m. They say that TCO now has his General Class license. Corky, of the Club and West Coast Ham Ads fame, sent the scoop on a DXpedition to Mexico over Labor Day by MYC, W8Q, and YGC. The Rio Hondo Radio Club announces meetings will take place at 7:30 p.m. the first Sat. of each month at the Youth Center in Palm Park, courtesy of the Whittier Dept. of Recreation, according to UKC. From *The Oscillator*, of the Associated Radio Amateurs of Long Beach, comes word that our RM BHG and his wife went to the rescue of some people on the road near Tulare. Hank's radio gear was working OK; however, nobody in Tulare was on the air so Hank literally had to blast his way for help with his auto horn. The Lockheed ARC, via its *News Notes* tells of the arrival of distinguished visitors, Commissioner E. M. Webster and others. The station call of the Radio 50 Club of Whittier is HUY and Jim Ashby is president. Secretary honors go to EYP, and the treasurer is the son of BLY. The gang is more a part of civic activities than many a club in the section, holding activities with the local police on at least one occasion during the year. BHG now is equipped with one-kilowatt emergency power at 115 v.a.c., single phase. MBW sports 300 watts into an 813 on LSN. LYG has a Gonset 20-meter beam and a Rocket-Quad on 2 meters. NJU has started at UCLA. K6CPX, the wife of GKM, schedules KX6AF and turned in a traffic total of over 100 in her first report. Let's hear from some more girls. ORS made 220-Mc. contact with NIT and QJF in Lynwood and Huntington Pk., respectively. AM's Chile rhombic is in a state of repair because of a thrashing machine. RNN, EC for E.L.A. District of Area B, also is trustee for MHM, club station of the Bell Gardens Amateur Radio Assn. Operation is on 160, 10, and 2 meters at present. Skyhooks in use are a 264-ft. flat-top and 10- and 2-meter ground-plane antennas. Traffic: (Sept.) K6FCY 735, W6LND 544, CMN 235, K6CPX 124, BW 10, W6USY 92, MBW 84, FMG 70, K6COP 26, W6BHG 23, CK 16, UGA 12, EBK 10, ORS 7, AM 4, K6BEQ 1. (Aug.) K6BWD 110.

ARIZONA—SCM, Albert H. Steinbrecher, W7LVR — (Continued on page 118)

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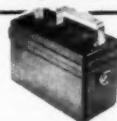


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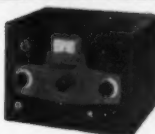
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Our new SEC, VRB, with his full kw. and a pair of 813s has been very busy reorganizing the entire AREC and has divided Arizona into 13 sections, with the following ECs covering the sections shown: BFA — Prescott Section, LAD — Tucson Section, KUJ — Ajo Section, LSK — Flagstaff Section, NYN — West Phoenix Section, and USX — East Phoenix Section. In addition to the above, JYH has been appointed assistant to the SEC, and UXZ is the EC for Novice Operations. There still are openings for EC appointments in the Kingman, Douglas, Morienc, and Winslow Sections. It is suggested that those interested in these appointments and in joining the AREC contact VRB, or the ECs in their respective sections, and listen on 3865 kc. for more information. The OPRC now issues WAT (worked all Tucson) certificates for 15 or more Tucson contacts to those living outside the city. Contact LAD, secy. The AARC of Phoenix elected the following: IRX, pres.; MWQ, vice-pres.; KWB, treas.; PMQ, secy.; and KOY, SUI, and UCA, board of directors. QEQ has 200 watts to 803s with a 40-foot vertical. PEG is mobile on 10 meters with a Subraco. Traffic: W7QFQ 101, SUI 70, VRB 32, LVR 30.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VET, ECs: BAO, BZC, DEY, DLN, HFS, HRI, IBS, KSL, KRU, WYAR, KM. NEHQ is a club in the area include The Dragnet, a teen-age group composed of high school students at Grossmont, Hoover, and Helix High Schools with the following officers: K6EFE, pres.; K6ADA, vice-pres.; K6DVD, rec. secy.; and K6ANV, treas. The Chula Vista Amateur Radio Club recently was formed with 22 charter members, is connected with c.d. and has a club station, K6HGA. The Gillispie Amateur Radio Club was formed for members of the county unincorporated area, and is connected with c.d. The La Mesa C.D. Net is now operating on 3825 kc. at 2000 each Wed. For information contact BAO, NIY and MVV are active on 420 Mc. in San Diego. SYA has returned to San Diego after a trip to England. WNN has a pair of 4-250As on 20 meters s.b. The AREC picnic near Fallbrook was a success with 10 AREC members and their families attending. K6NHQZ is a new Novice in Palm City. The Coronado Radio Club expects to have a new San Diego County amateur directory ready for distribution in early January, 1955. JCF, past-pres., of the Coronado Club, passed away at Moffatt Field. The visit and talk by HDQ was well attended and enjoyed by many hams in the San Diego Area. AF, now has a two-element 40-meter beam in operation. The Coronado Radio Club is having a DX contest lasting until March, 1955. We note that FJH, past-SCM and EC for Escondido, has moved to the Pasadena Area. Merry Christmas and good DX in 1955 to all. Traffic: W6LAB 3263, YDK 574, IZG 538, KVB 49, FCT 11.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — JCS has gone to Memphis, Tenn. Good luck to you in W-Land, Mac, and thanks for your cooperation while at K6CST. K6NBI radioed in another fine traffic report. K6CRJ made 43 contacts in 3 sections during the V.H.F. QSO Party. QIW says he knows of several stations working traffic in this section but cannot get them to report their activity. Reports from all active stations in the section are welcomed. Just drop a card to the SCM at the end of each month. FYW is active on CARS, which operates on 3645 kc. at 7 P.M. Traffic: K6CST 510, NBI 114, W6QIW 43, K6CRJ 10, W6FYW 2.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC, RRM, PAMs: IWQ and PAK, RMAs: PCN and QHL. PAK, new PAM, is at present net manager of the NTO Traffic Net. LUP announced that amateurs have a booth at the Odessa Oil Show. 4TRY/5 is a newcomer to Waco, also 6IZT. The Central Texas Amateur Radio Club at Waco announces new officers are VHF, pres.; ZSY, vice-pres.; BHX, secy.; TUB, treas. The 160-meter Blue Ridge Net reports 88 per cent attendance for September. LUD is going to Texas Tech. at Lubbock. AHC reports working ZL38P on 40-meter c.w. with 25 watts. JNK reports his XYL passed the General Class exam. The Snyder Amateur Radio Club's new officers are KXY, pres.; DWV, vice-pres.; and CRP, secy.-treas. WN5GQO is a new call in the Club. We extend our sympathy to TTU, who lost her sister recently. LHF is a Silent Key. Amateur Radio Day at the State Fair drew the largest number of amateur knaves to have gathered at one time in the Northern Texas section, according to some estimates. Fort Worth was awarded the next West Gulf Division Convention. The group at the Convention representing the AREC in Northern Texas section went on record as favoring a 2-meter net for the entire section for emergency work. The Snyder Amateur Radio Club and the San Angelo Amateur Radio Club are now ARRL affiliates. Traffic: W5TFB 675, AHC 208, KPR 139, PAK 131, YPI 104, TTU 63, UBW 41, UFP 40, ZWR 29, TFP 26, CF 21, AEV 20, RHP 1.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY, PAMs: PML, SVR, and ROZ. RM: GVS. PAK has accepted the job as net mgr. of the N. Tex.-Okla. Net. This Net meets daily on 3960 kc., 1730 to 1830 CST. Those who do not like

(Continued on page 114)

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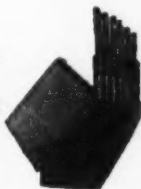
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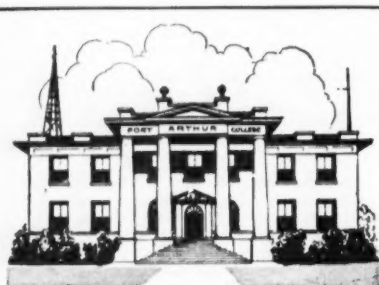


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nets, please remember there are from 40 to 60 stations occupying one frequency for one hour and at the same time justifying band occupancy for all hands. PML is net mgr. for OPEN and is a new PAM. CRQ has resigned as SEC because of the press of business and KY has accepted the appointment and will, I am sure, do a bang-up job. A new Novice is WNSHBL, Enid, 14 years old. GZW is ex-8NFO. EJJ has a new harmonic, a.m. not s.s.b. WNSERV has a new receiver and worked into St. Louis with 5 watts on 7 Mc. UZG has gone to W6-Land. Several Oklahoma hams received mention for their assistance in the Powder Puff Derby. The West Gulf Division Convention at Kerrville was a great success with plenty of prizes and entertainment, thanks to the Kerrville gang and FNH in particular. ARRL President @TSN, Vice-President 5NW, Director 5CA, and SCMs 5JQD, 5FJF, 5ZU, and 5RST were all there. All three candidates for Director, CA, CF, and FJF, were there. An estimation of about 100 mobiles there was made. Traffic: WGV8 211, FML 36, 5WJ 31, RST 22, AIC 20, ZCE 19, TNW 18, REC 13, EHC 11, PAA 10, FEC 9, SVR 8, WSM 7, RDI 6, PNG 5, MEX 4, CCK 3.

SOUTHERN TEXAS — SCM, Dr. Charles Fernaglich, W5FJF — The recent ARRL Regional Convention held in Kerrville was an FB affair. Everyone seemed to have a good time. As usual there were plenty of prizes and some very nice social gatherings. FNH, DSH, BEO, TSC, TSF, TQN, the XYL of DEH, and the XYL of FNH were the ones who did the work. Morris, an SWL from Austin, was there to display his excellent photographs of hams throughout the area and to take new ones. G. L. Dosland, President of ARRL, attended and answered many questions concerning the policy and actions of ARRL. There were several excellent programs by EJJ and CJP, also an excellent v.h.f. program conducted by EKK and featuring HPC, KSW was in Houston recently, and he looks very well. Keith has gained a considerable amount of weight. He is one man so devoted to amateur radio that when he is too ill even to eat, you can hear him on one of the bands with his bedside rig. Keith is OK now and hamming more than ever. He is going s.s.b. and has a real antenna farm. Let's send in some more dope. GER moved to San Antonio from Dallas. F3X also recently moved back to San Antonio. JC has gone hi-fi. Traffic: W5MN 844, GER 49.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: KCW, PAM: BIW, V.H.F. PAM: FPB, RM: JZT, NMEPN meets on 3838 Tue. and Thurs. at 1800, and Sun. at 1730; the NM Breakfast Club every morning except Sun. 6700 on 3838 Tue.; the NM Club meets on 3633 Tue. at 1900. Mr. Herbert Moran, Regional C.D. Communications Officer, has conferred with New Mexico officials regarding a RACES plan for the State. The Portales Radio Club adopted a constitution and selected the name I-Tappa-Ke, with 25 charter members. AKR talked to Albuquerque Kiwanis on "Ham Radio." KN6GCL is attending ENMU at Portales. WNS ECQ and ECR are active on Gallup. CIN reports Farmington has a BC-610 with emergency power, also five mobiles. Scores in the V.H.F. QSO Party were FAG 24, VWU 10, EYR 7, NSJ (on 420 Mc.) 2. Newcomers on 144 Mc. are JLD, WBA, YXM, 9EYV/5, 9WGG/5, VJN, and BGF. KCW again is active on 144 Mc. During the Pecos Valley flood on Oct. 7-8, AK provided communications for Hagerman; ARRL CXC, and EFT for Dexter; PSF and UTS for Artesia; QKA, RNC, YAS, and ZGG for Carlsbad; AHQ, BZA, BZB, FAB, PGJ, QKG, RZS, TBP, TDB, UP, WPA, YFN, YUM, YWU, ZM, and ZU for Roswell. Mobiles especially active were BZA/BZB, CXC, UP, WPA, and YUM. Traffic: (Sept.) W5AHQ 146, BTB 20, WPA 17, CEE 9, CXC 9, ZU 8, HJF 7, BXP 4. (Aug.) W5HJF 21.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, IDB, SEC: RR, PAMs: VE1OC, V06N, ECs: VE1DQ, V06U. New appointees: V02AW as PAM, V02G as EC, V06X as RM, W1UBW/V06 as OBS. Bonquets to those who did such a swell job of traffic-handling during Hurricane Edna. Outstanding were the gangs at VE1DW and VE1FQ, who operated with emergency power and passed weather and damage reports throughout the storm. Recent visitors to VEI were VE3ANB and VE8SK. Best wishes to DZ, NR, and ex-88F on their recent marriages. ADU is giving the new Telrex beam a workout on 14 Mc. Officers of the N.B. Amateur Radio Assn. are WB, pres.; ADU, 1st vice-pres.; UL, 2nd vice-pres.; UT, secy-treas. The organization has directors from the N.B. counties, a good membership, and is off to a fine start. EC V06U and the AREC group held Operation Dew Drop and covered the Goose Bay Area with operations on 51 Mc. V02AW, ex-VE3BTQ, is active at Gander. Also heard in the Gander Area are V02s F, G, CM, and S. Is your community prepared for emergencies? Contact SEC VE1RR for details on forming your Emergency Corps now. Traffic: (Sept.) V06N 394, VE1FQ 342, V06U 113, V06B 87, V06S 61, V06X 55, V06AH 31, VE1UT 27, VEIME 24, VE1A 16, VE1BL 14, VE1OM 4, VE1ZZ 4. (Aug.) V02AW 11.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Congratulations to the following recently-licensed YLs in the
(Continued on page 116)

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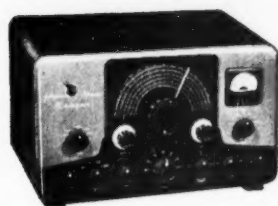
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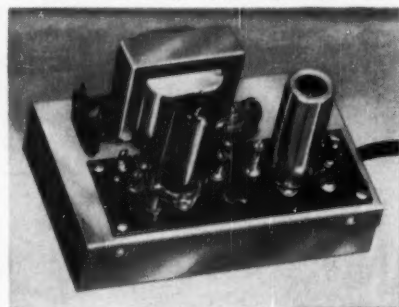


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Additional Details in *CQ Magazine*: Page 32, Dec., 1953



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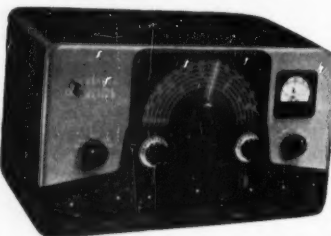
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North Bay Area: BFE, DUZ, BRJ, DVO, DVU and DVV. Hospital officials are grateful to the Ontario Fone Club for the generous donation, which will assist in further work on behalf of children. GI is manager of TRN. DSM now is Class A. The Belleville Club meets in the YMCA. AAC pounded out a good signal from lake QTH. NZ caught some fish at the shore. The club picnic was held at P.A. Club picnic at Collingwood. DTO and DUG are newcomers in Toronto. AXG now is located in Kitchener. CAB, now Class A, mobiles on 75 meters. AAS returned to Belleville after one year in VES-Land. NN is heard mobiling. Officers of the Brantford Radio Club are CP, pres.; BSG, vice-pres.; J. H. G., secy.; and W. L. S., asst. secy. J. H. G. is also Chaplain. AJR and DNV attended the Findlay, Ohio, ham picnic. Sixty members of the v.h.f. fraternity attended the meeting at Oakville. It was nice to see such a fine representation from New York State. WZUTH delivered a splendid talk on emergency work in the Rochester Area. DIR and RY were present. The meeting was well attended. WZYL of AGW was congratulated on getting her ticket. DHG has completed work on the ten-meter walkie-talkie. With regret we record the passing of AVF, whose fine signal out of Clarkson will be missed. Traffic: (Sept.) VE3HR 250, ND 196, TM 99, ATR 91, EAM 62, BJV 44, AUC 31, VDA 8, ZL 3, ABCV 1, YF3KML 6.

BRITISH (Aug.) LUMBLE, SCM, Peter McIntyre, VE7JT — Taking a look in the perspective at this column I have come to wonder what is the value of same. Other than two or three interested persons who take the time to send in activity reports and traffic counts the rest of you just sit and hibernate and wait to see what the other guy will do for you. Seemingly the VE7s are the most inactive bunch of operators I have ever seen. I am not sure of anything. You ask, "Why don't you listen on the bands?" Well, 75 per cent of my time is spent listening and about 1 per cent of what I hear is "BT" to comment on. Amateurs are individualists but individuality does not mean hibernation or stagnation. I would like, for once, to have enough material from the VE7s so that it would have to be edited to fit the space available. I am not sure of the amount of space allocated for each month but let's get some more put in it not just gleanings from the few. If you are interested enough to read this you should be interested enough to help make it interesting for the other readers. Your "comments," by letter, would be appreciated, and maybe in this way we can have an interesting column of what's what in the VE7s. I have responded to the two-minute pattern on 3755 kc. and the Wednesday Night Swap Time? see you on 3755 kc. nightly. Traffic: (Sept.) VE7FT 79, QC 55, DH1 23, ZV 18, (Aug.) VE7QC 150.

MANITOBA — SCM, Leonard E. Cuff, VE4LC — The end of another year is drawing near and as it is not possible for me to meet all of you personally I wish to take this opportunity to wish you all a Very Merry Christmas and a Happy and Prosperous New Year. Traffic: VE4AI 60, VE5DS 27, VE4HL 22, GE 21, KG 12, EF 9, YR 7, CK 6, RB 6, XP 6, NW 5, VE5GO 4, VE4EY 3, FD 3, EU 2, GR 2, VE4IK 2.

SASKATCHEWAN—SCM, Harold R. Horn, VEGHR DD was presented with a Viking mobile unit for 25 years service as minister in his church. Congratulations, Perre. Dad has his ticket endorsed all-band A3 now. JV had top c.w. score for Saskatchewans in the ARRL DX Test. AJ's mobile works lots of DX with his Viking. EL tested in his hometown of Edmo. With his colorful personality, he is a true fire burns to his hands and face. New officers of the Saskatoon Radio Club are RL, pres.; AJ, vice-pres.; MK, sec.; OB, treas. Ex-5PR now signs 6HP. New net time is 1830 hours daily. You are invited to check in or become a member. Frequency is 3780. Best wishes to you and yours for a happy future. 26, B414, JRR LL, GO8, G8, PJ6, Q14, 4, RE4, BF 2.

The Toledo Radio Club is sponsoring the "Worked Toledo, Ohio" award. The WTO certificate will be given to any radio amateur submitting confirmation of contact with fifteen amateurs in the Greater Toledo area. The outlying communities of Holland, Maumee, Perrysburg, Sylvania, Curtice, Moline, Walbridge, Tribley and Rossford are considered as part of the Greater Toledo area. Contacts may be made over any period of time, between mobile, fixed or portable stations, crossband, 'phone to c.w., or any possible combination so long as the FCC regulations are adhered to. Confirmations should be sent to Maynard Nelson, W8IHF, 5514 Roan Road, Sylvania, Ohio.

An amateur radioteletype exhibit at the Western Washington Fair, held in Puyallup, Wash., in September, met with considerable public interest, W7HMQ reports. RTTY contacts with Alaska, W6-land, and local stations were logged.

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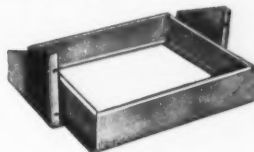
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118

120-Watt Modulator

(Continued from page 19)

sounds, in view of the fairly large capacitance tolerances that are usually associated with paper condensers. The ideal method would be to measure the capacitances and pad them out to the correct values, and if the facilities are available to do this it is a recommended procedure. However, even quite wide departures from the theoretically correct values do not greatly affect the performance from a practical standpoint — that is, in the way the transmitter sounds or in the suppression of splatter. A reasonable procedure, therefore, is to pick out a standard value of capacitance that lies somewhere on the load resistance line between the 2500- and 3500-cycle curves.

It will seldom be possible to find an iron-cored choke having exactly the required inductance. However, it is easy to modify a "television" power supply filter choke for the purpose. These usually have ratings from 1 to 2 henrys at 200 or 300 ma. Measurements on a "1-henry 300-ma." choke of this type (Stancor C-2326) showed its inductance to be about 1.9 henry, without d.c. and with small applied a.c. voltage. Removing the entire stack of I laminations reduced the inductance to 0.53 henry. Calculations based on the total resistance and the wire size (No. 28) showed that the choke had about 22 layers, so 7 of these were unwound and the inductance was then measured with various air gaps, using paper and cardboard spacers. The measured values are shown in Table I.

In the course of making measurements it was found that the presence of the "finishing" laminations that overlap the I sections on each side of the core had a very marked effect on the inductance and Q. These end pieces cause a pronounced increase in inductance for a given air gap, as compared with the inductance when the end pieces are not assembled with the regular core pieces. They also reduce the Q of the coil to less than half the value obtained when they are not used, presumably because of flux concentration in the small cross section of the overlapping part. They were therefore not used in making the measurements in Table I, nor in reassembling the choke shown in the photograph, the whole works being held together by clamps made from tempered Presdwood. The Presdwood mounting also serves to insulate the core from the chassis, which should increase the coil-to-chassis breakdown voltage.

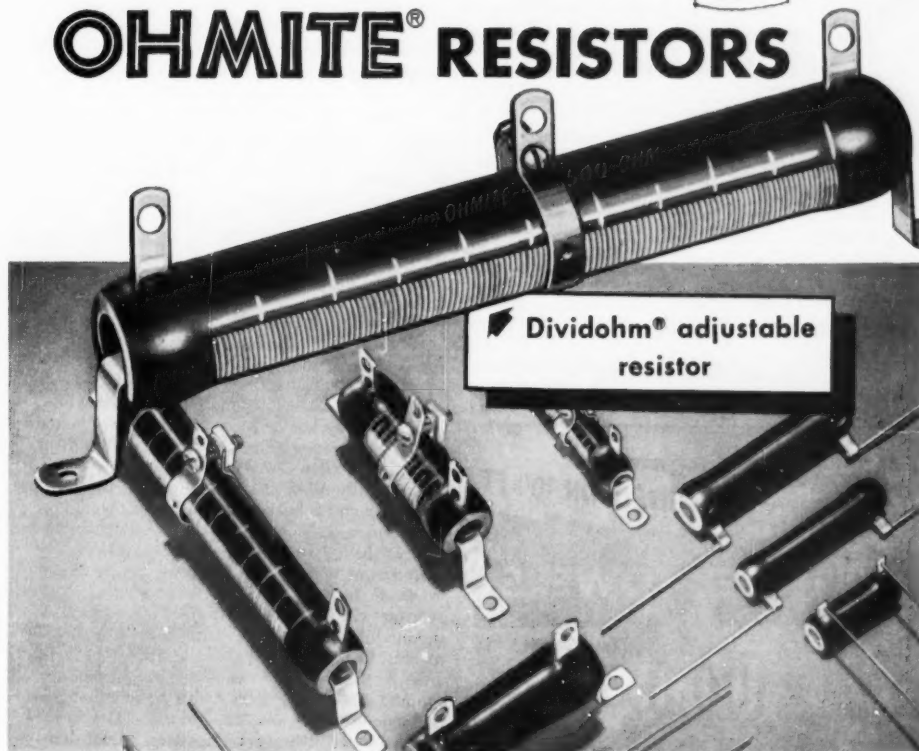
Table I shows that for air gaps above 0.020 inch, the inductance changes fairly slowly with the thickness of the gap, so in this range — roughly 0.25 to 0.5 henry — this particular type of choke as modified can easily be adjusted to any value required for Class C loads ranging from 2000 to over 5000 ohms. This covers most of the practical cases. Measurement of the inductance is desirable but not necessary if the thickness of the spacer used in the air gap can be measured with moderate accuracy.

(Continued on page 120)

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The inductance of a choke varies with the a.c. voltage applied to it as well as the direct current flowing through it. Because of the rather large air gap that is used in this application the d.c. component is of practically no consequence. Checks showed, however, that the inductance increased about 15 per cent at a.c. levels representative of full audio output from the modulator as compared with bridge measurements made with a low-voltage source. An allowance of this order can be made in determining the proper air gap. The figures in Table I are based on bridge measurements of inductance.

Performance Data

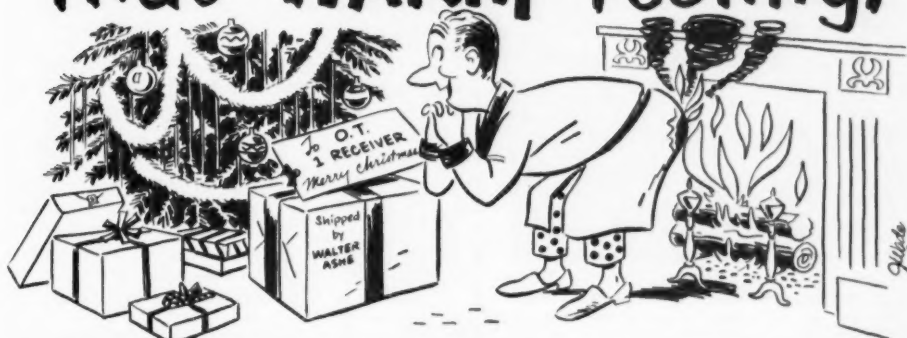
The over-all frequency response of the system including the splatter filter is such as to tend to emphasize those frequency components that contribute most to effective speech transmission, without sacrificing that nebulous thing called "satisfactory quality." Judged by listening tests, the balance between highs and lows is quite satisfactory; also, there is no difficulty in identifying sibilant sounds such as "s" and "f" which often become indistinguishable when the highs are cut too much. The response curve is essentially flat (within ± 2 db.) between 350 and 2800 cycles with the components and values given in the diagrams, and using a splatter filter designed for working into a 5000-ohm load (measured values, 0.47 henry and 0.01 μ f.). Compared with the level at a 1000-cycle reference, the response is down 6 db. at 200 cycles and 12 db. at 100 cycles. At 3000 cycles the response is down 4 db. below the same reference, and drops at a uniform rate of 20 db. per octave above 3000 cycles.

Practically all of the attenuation at the high-frequency end is in the splatter filter. The modulator and speech amplifier are intentionally cut only at the low end and the response stays fairly uniform out to 5000 or 6000 cycles. On the premise that the frequency components that cause splatter will practically always be generated in the modulator or Class C amplifier, as discussed earlier, the ones generated in the modulator obviously have to be suppressed between the modulator and Class C amplifier. Reduction of high-frequency response elsewhere in the audio system accomplishes little or no splatter reduction — since the legitimate high-frequency components in the ordinary voice are of low amplitude — and simply causes a loss of intelligibility and naturalness. In other words, there is no point in cutting the high end unless it is done in a splatter filter, located in the right spot to catch not only the legitimate components outside the needed band but also the spurious components.

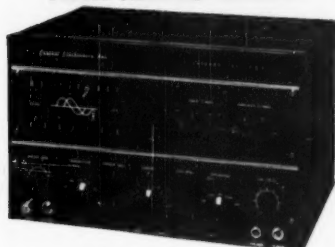
The measured power outputs at various voltages were mentioned earlier. The power supply filtering, plus low-frequency cutting, result in a hum level that is largely masked by the first-stage noise, without voice input and gain at maximum. At maximum output with a pure tone signal the hum increases because of the heavier drain on the power supply, and appears practically entirely in the modulator output and not in

(Continued on page 122)

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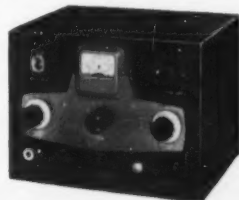
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KK-50	1/2" diameter nut	\$3.25
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the earlier stages. At this level the signal-to-hum ratio is over 30 db. With voice input and gain adjusted for full output on peaks the drain on the supply is considerably less and hum is not observable.

With sine-wave input, the plate current at full output is 240 ma. when the load is adjusted to the appropriate value for the plate voltage in use, as listed earlier. This maximum current is practically the same at all plate voltages listed, since the plate dissipation rating of the 6146 does not permit using a bias value that gives a very large value of no-signal plate current. The grid bias should be adjusted for a total plate current that represents a no-signal input of slightly under 50 watts at the particular plate voltage used.

The voltage gain from the microphone input to the modulator grids is such that full output can be secured with an input voltage of about 3 millivolts, r.m.s. This is of the order of one-tenth the voltage available from a crystal microphone with close talking.

Technician Rig

(Continued from page 30)

a microphone and apply power. With the gain control advanced, talk into the microphone and check to see that the lamp load brightens with modulation. The gain should be set so that normal speaking close to the microphone produces a just-perceptible flicker in the bulb.

The rig is now ready for connection to an antenna. Suitable types for both bands are described in the v.h.f. antenna chapter of recent *Handbooks*. Open-wire line or 300-ohm ribbon is suitable for the transmission line, and either can be connected directly to the antenna socket. The operating frequency should be checked again after the antenna is connected, as it may be shifted in the process. Antenna coupling should be the minimum necessary to transfer energy satisfactorily. A simple field-strength meter that is suitable for both 220 and 420 Mc. was described about a year ago in *QST*.³

It is suggested that modulated oscillator operation be confined to 221 to 224 and 421 to 432 megacycles, leaving the remaining frequencies for crystal-controlled rigs. Be careful to avoid the band edges.

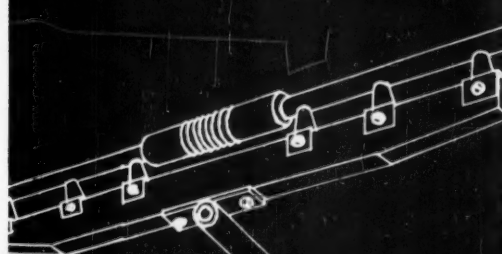
About 8 watts input may be run on either band. When the coupling loop is adjusted for 8 watts on 420, however, the input will be about 5 watts on 220. This will provide about equal output on the two bands because of the different efficiencies. About 1½ watts output can be expected.

In working stations using broad-tuning receivers, set the audio gain to the point that gave an appreciable brightening of the load lamp. When the fellow you're trying to work has a selective communications receiver, your audio level will have to be much lower. A high level of modulation will swing your transmitter frequency too much for him to be able to understand you.

³ Tilton and Southworth, "A 220-Mc. Station for the Beginner," Part III, *QST*, December, 1953, page 43.

FOR "40"

2 Element, 40 Meter MOSLEY VEST POCKET BEAM



Real 40 Meter DX and effortless solid QSO's are yours with the MOSLEY 40 Meter "V-P" Beam Antenna!

Developed from the tried and proven *Original Design* MOSLEY 20 Meter Vest Pocket Beam, the Model VPA40-2, for the first time, provides outstanding 40 Meter beam performance ... at low cost and with an array of convenient size and weight!

SPECIFICATIONS

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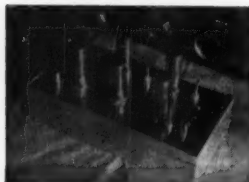
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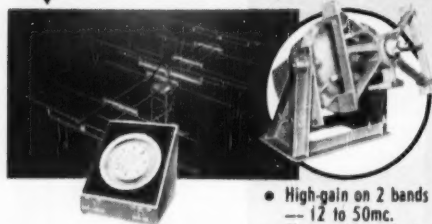
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Interpolation Oscillator

(Continued from page 31)

can be calibrated when the modulating tone is changed to 600 cycles.

Although the receiver b.f.o. can be used for this purpose, a separate b.f.o., built for the purpose, will provide greater accuracy and convenience. Fig. 1 shows a suitable circuit. The tuning circuit is one that permits adjusting the frequency range accurately to cover the desired band.

C_3 is the calibrated bandspread condenser. C_1 is a zero-temp. fixed mica or trimmer condenser. C_2 is an air variable to aid in accurate adjustment of the tuning range. Slug-tuned coil L_1 limits the tuning range in the low-frequency direction. The values shown in the diagram are approximate.

As an example of adjustment, for 455 kc. set the slug of L_1 about half-way in. Set C_2 and C_3 at about half capacitance. Then adjust L_2 to tune the circuit to 455 kc. Then use L_1 to set the low-frequency limit, and C_2 to set the high-frequency limit of the tuning range of C_3 . By careful trimming of all four components, the range may be set at the desired point.

The unit should be sturdily built, of course, and be provided with a large-size vernier dial of good quality. The unit should be shielded to prevent harmonics from getting into the front end of the receiver, and a shielded injection lead should be used. Both the receiver and the b.f.o. should be well warmed up before using, of course. With care, it should be possible to make readings to an accuracy of 50 cycles at any frequency with this system.

Conversion Attachment

(Continued from page 33)

can be brought through and is most easily connected to Pin 4 of the second i.f. tube. Near the front goes the B+ 105-volt regulated lead. This is best picked up from the screen terminal, Pin 6 of the second i.f. tube. If in some sets this screen terminal is not connected directly to the VR tube, then, of course, the 6BE6 plate voltage should be taken directly from the anode of the VR tube.

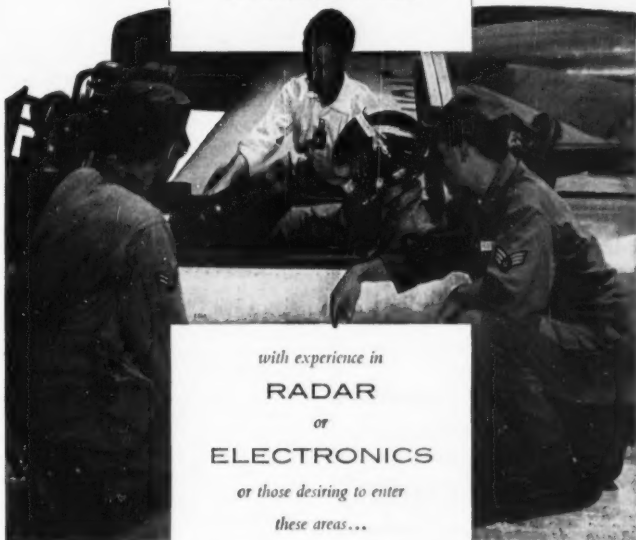
Adjustments

Turn on the set and shunt the dropping resistor for the regulator tube until this tube lights. About 5000 to 10,000 ohms at 5 watts will probably be right. It is desirable at this point to check the approximate frequency of the oscillator section of the converter tube. Its signal can be picked up on a communications receiver and it should oscillate over a range in the vicinity of 10,245 kc. Put the cover on the outboard unit and allow the whole works to warm up for some thirty minutes before proceeding with the alignment.

A signal generator covering 455 kc. and 10.7 Mc. and an output meter are essential. The latter may be an a.c. voltmeter with a blocking

(Continued on page 126)

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condenser of about 0.05 μ f. Connect it from the plate of the audio tube to ground. Or it may be a 20,000-ohms-per-volt or a vacuum tube voltmeter connected from the a.v.c. bus to ground. First align the 455-kc. section. The final alignment of these circuits should be made with the signal generator connected to the oscillator grid, Pin 1, of the 6BE6 converter tube. Keep the signal generator output as low as possible for the final touching up. After these circuits are aligned, under no circumstances whatsoever touch them again.

The signal generator can then be shifted to the signal grid, Pin 7 of the converter tube, and the frequency set at 10.7 Mc. Adjust the oscillator frequency with the slug-tuned coil to bring this signal through. Check that the converter oscillator is at 10,245 kc., on the low side of the signal, not 11,155 kc., on the high side. Now connect the generator to the first mixer grid, Pin 2 or 7 of the 12AT7 mixer. The 10.7-Mc. i.f. cans can now be aligned. The final trimming should again be done with the signal generator output as weak as can be used.

Remove the generator, replace the cover on the bottom of the set and, without an antenna connected, tune the receiver across its range to see if any birdies show up within the band. Should one appear, change the second oscillator frequency (with the slug-tuned coil) to a lower frequency, if the birdie is at the low end of the band, or higher if at the other end. Reconnect the signal generator to the signal grid, pin No. 7 of the 6BE6 converter, and, keeping the signal as weak as possible, retune the generator for maximum output. Then following the earlier procedure, realign the 10.7-Mc. i.f. transformers to whatever frequency the generator is now set. Continue this procedure, if necessary, until the birdie is outside the band.

Should i.f. oscillation occur, it will probably be in the 10.7-Mc. circuits. It can be tamed usually by judicious dressing of the plate, the B+ and the 455-kc. grid leads inside the receiver. These can be shielded from each other with the disk ceramic condensers scattered around the tube sides. If this is not sufficient, a 33-ohm composition resistor can be placed between cathode and ground of the first i.f. tube. Leave this resistor unby-passed.

The details given here are for the Sonar SR-9.

For other sets, the procedure will vary but the following basic points will hold. Use only one stage of low frequency i.f. The front end stability will probably not permit greater sharpness. For mobile use, a second conversion to 1500 kc. might allow easier tuning and will help if the first local oscillator is not too stable under road shock. Use 105 volts, regulated, on both plate and screen of the converter tube, not only to gain stability but to save a screen-dropping resistor and its associated by-pass. Use a high-C oscillator; from 150 to 200 μ f. is about right for the tank condenser, which should be a silver-mica or other high-stability type. Do not apply a.v.c.

(Continued on page 128)

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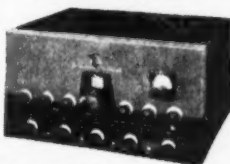
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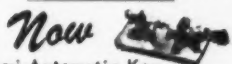
The No. 90651 Millen Grid Dip Meter is compact and completely self-contained. Has seven calibrated uniform length scales from 1.5 mc to 300 mc plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc..... **\$61.50**



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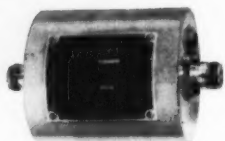
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See Page 158

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to the converter tube grid as this will tend to shift the local-oscillator frequency. Use a reasonably low-gain converter such as the 6BE6. Don't hesitate to cut the i.f. gain for stability. The extra gain of the converter stage will compensate. It is not necessary to use the grid resistor and blocking condenser between the 455-ke. transformer and its i.f. tube. The a.v.c. can be brought to the ground lead of this transformer through a decoupling network consisting of a 1/2-megohm resistor and a 0.01- μ f. condenser.

On two receivers so modified, the over-all gain was increased about 10 db. while the background noise of man-made QRM was greatly reduced. This improvement meant the difference between communications or not over the difficult circuits on which these units were used.

Grounded-Grid Amplifiers

(Continued from page 58)

plate lead. The lead from the grid to the grounding capacitor was as short as possible, and was made out of 1/4-inch copper strap. No fussing was necessary and the amplifier was completely stable. It is suggested that the 304-TL be submounted so that the internal grid shield is about on the same level as the chassis, and that the clearance hole be made not larger than necessary to clear the tube envelope at that point. Due to the protruding grid terminal, the tube must be wiggled a little to get it through the hole, but once the grid terminal is through, there should be ample play so that the tube may be inserted in the socket without difficulty.

Linear Operation

A question of major interest whenever linear amplifiers are used is just how linear are they? It can be easily shown that when small-signal operation is considered, there are good reasons for expecting the grounded-grid amplifier to be more linear than a comparable grounded-cathode amplifier. It would seem reasonable, then, to expect some perhaps smaller improvement when large-signal operation is considered.

To try to get some numerical data on this point, a series of runs was made using a 4-250A as a zero-bias amplifier, both grounded-grid and grounded-cathode. Comparable operating conditions were used in both cases.

The usual trapezoidal oscilloscope pattern is not sensitive enough to indicate differences in linearity of the small magnitude under consideration, so a technique was used based on the fact that if a modulated signal is applied to a slightly nonlinear amplifier, the nonlinearities will cause spurious modulation products to appear in the amplifier output. The magnitudes of these spurious products compared with desired products give an indication of the amount of nonlinearity in the amplifier.

The actual procedure is as follows: The driver is amplitude-modulated with a steady audio tone.

(Continued on page 130)



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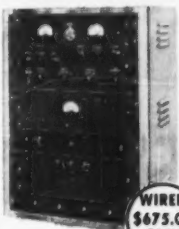
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Its output will then consist of a carrier and two sidebands, the sidebands being spaced on each side of the carrier by an amount equal to the audio modulating frequency. This signal, when passed through the slightly nonlinear amplifier, will be distorted, and the distortion will appear as extra sidebands on the output signal spaced at multiples of the modulating frequency from the carrier. The ratio of the amplitude of the first undesired sideband to that of the desired sideband (nearest the carrier) is a convenient measure of the distortion.

To get accurate data, the receiver used to detect and measure the sidebands must have enough selectivity to separate them properly, and it must have an accurate S-meter. The selectivity problem is made easier if a relatively high audio modulating frequency is used, as this increases the separation between sidebands. The S-meter situation is not so good, as few, if any, receivers give really reliable signal strength indications. If a signal generator having a calibrated attenuator is available, the S-meter may be calibrated against it.

Using this technique, the general conclusion reached was that the grounded-grid arrangement consistently gives slightly better performance than the grounded-cathode circuit. Improvements of the order of 3 to 6 db. were noted (6 db. corresponds to a reduction of the amplitude of the distortion by a factor of 2).

Plate Modulation

One check run was made driving the grounded-grid amplifier with a steady signal and plate modulating it in the usual fashion. The question is whether the unmodulated signal from the driver which feeds through to the output will substantially reduce the percentage of modulation. This unmodulated signal, the same one discussed earlier in connection with Fig. 1B, appears in the output regardless of the amplifier plate voltage. As plate modulation simply consists of varying the amplifier plate voltage, the output of a plate-modulated grounded-grid amplifier will consist of the regular modulated signal plus an unmodulated signal from the driver.

It is to be expected that the tubes which require the least r.f. driving voltage would be the most free of this effect. The 4-250A was set up as a zero-bias amplifier, with about 500 watts d.c. plate input, and plate modulated. It was found that the unmodulated part of the signal only amounted to about ten per cent of the total output power, which was consistent with the estimated driver output of about 50 watts. The resultant small decrease in modulation would not be noticeable in most cases.

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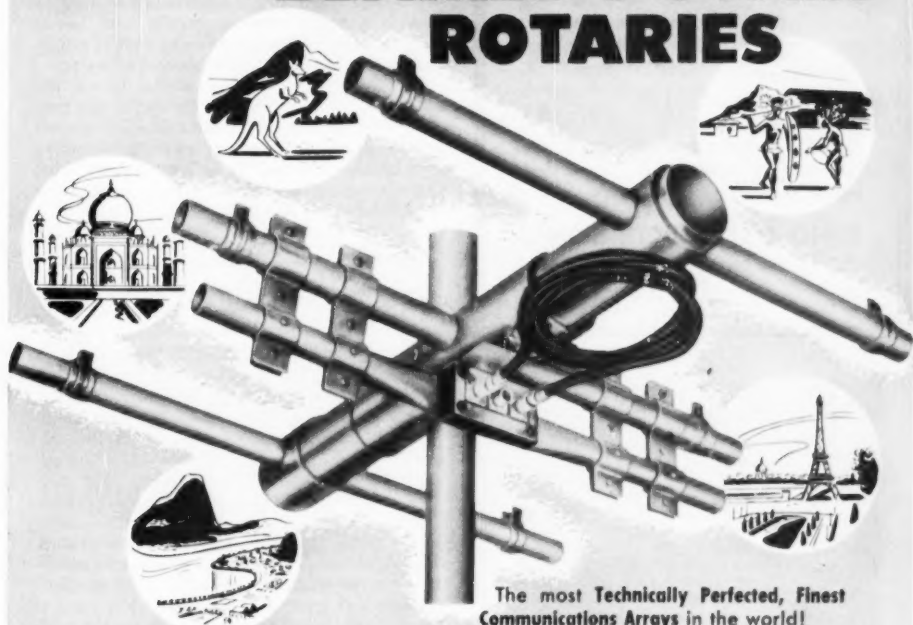
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(Continued from page 41)

For s.s.b. operation, the 500-W can be run in Class AB₁ or AB₂, depending upon the amount of drive that is available. The maximum rating is 250 watts of peak envelope power output, under which conditions the grid current (four tubes) will swing up to about 12 ma. and the cathode current of a single tube will swing to about 130 ma. About 10 watts of peak envelope power is required to drive under these conditions.

Used as a linear for a.m., the manufacturers suggest using speech clipping in the modulator of the low-level modulated stage at about 90 per cent modulation and adjusting the linear for slightly less than 100% modulation capability. This is a worth-while suggestion that boosts the capability of the amplifier so that it can be run with a carrier output of around 90 watts.

We didn't have an opportunity to see the instruction book, but we understand that it goes into detail on the use of the excitation control and the rectified r.f. output indicator in tuning up a linear, which should be a big help to those who are coming face to face with linear-amplifier operation for the first time.

— B. G.

40-Watt Rig

(Continued from page 14)

others, and by adjusting C₂ it is possible to get more output. When using a 7.1-Mc. crystal and tripling in the oscillator, one can expect to get a 2- to 3-ma. reading in the grid position.

Shown at Fig. 2 is an antenna system for two-band operation, 7- and 21-Mc. The 67-foot length is actually a compromise between the 21-Mc. long-wire dimension of 68 feet 5 inches, and a half-wavelength of 65 feet 2 inches for 7 Mc. However, the 67-foot compromise shows a low standing-wave figure and worked out well in actual operation. On-the-air tests produced some excellent contacts and reports. When the 21-Mc. band is "open," one can easily "work the world" with the power available from this rig.

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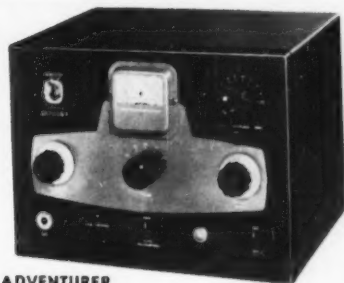
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Field Day Results

(Continued from page 50)

WIWQM/1	Port City Amateur Ra-	475-	B-15-	3000
W9LL/9	Lake County Amateur			
W9SWQ/9	Radio Club	412-	AB-12-	2997
W9ULJ/9	Four Lakes Amateur			
W6VB/6	Radio Club	348-	AB-25-	2955
W6YAS/6	(nonclub group)	301-	A-9-	2934
W1AWA/1	Santa Monica Mike and			
W1WFB/1	Key Club	320-	A-	2880
VE3BXT/3	Frank Wiggins Amateur			
W5DSZ/5	Radio Club	319-	A-14-	2871
W6LNO/6	Quannapowitt Radio			
WITKA/2	Assn	313-	A-11-	2817
VE1ND/1	Milford Amateur Radio			
W9QAY/9	Club	309-	AB-14-	2730
W5SRW/5	Seabrook Amateur Ra-			
W5JIC/5	dio Club	276-	A-14-	2709
W3VPR/3	Caravan Club of Loui-			
W9DUP/9	siana	397-	AB-	2691
W3QYK/3	Air Capitol Amateur			
W7LA/7	Radio Assn	366-	AB-25-	2582
W6RKY/6	Stamford Amateur Ra-			
K2IBL/2	dio Club	388-	AB-16-	2505
K6BLM/6	Frederickton Amateur			
W2QK/2	Radio Club	253-	A-7-	2502
W3PGA/3	Kathlakee County Am-			
W5TRV/5	ateur Radio Club	415-	B-7-	2496
W8CCO/8	Mesilla Valley Radio			
W4GCW/4	Club	408-	B-22-	2448
W5BXX/5	Fort Smith Radio Clu-			
W1UN8/1	b	393-	B-18-	2358
W1MB/1	Anne Arundel Radio			
W8DC/8	Club	367-	B-15-	2352
VE6NQ/6	DuPage Radio Club			
W9IAW/9	Flood City Radio Club	253-	A-23-	2277
K6PHM/6	Twin City Radio Club	378-	B-30-	2268
W1U F/3	Paseo Routes Radio Clu-			
VO1N/2	b	348-	AB-8-	2199
VE7ND/7	Avenel Radio Club	243-	A-10-	2187
W1DGV/1	Glendale Civil Defense			
W1PCC/1	Radio Council	306-	AC-8-	2175
W4HQE/4	Amherst Civil Defense			
W5YJU/5	Group	302-	AB-16-	2064
W1RIM/1	Aero Amateur Radio			
W3FE/3	Club	346-	B-11-	2058
K2EY/2	Pampa Amateur Radio			
VE3AJ/3	Club	340-	B-	2040
W6CG/6	Northeast Amateur Club			
W2HVL/2	Pickens County Ama-	359-	BC-19-	2013
W2ROJ/2	teur Radio Club	305-	B-6-	1980
W38OB/3	Louiseview Amateur Ra-			
W1AA/2	dio Club	288-	B-11-	1878
W6MGJ/6	Caedonia Amateur Ra-			
W7DK/7	dio Club	306-	B-10-	1848
W3NA/3	Salt Lake Amateur Radio			
W9HA/9	Club	209-	AB-24-	1836
W8ACW/8	Grand Rapids Amateur			
W6NCL/6	Radio Assn	285-	AB-	1818
W6KA/6	Calgary Amateur Radio			
VE3BER/3	Assn	242-	AB-7-	1569
W2DPQ/2	Twin City Radio Club	204-	AB-12-	1515
W6PMI/6	Yuba-Sutter Radio Club	140-	A-12-	1494
W2GM/2	Annapolis Radio Club	134-	A-10-	1431
W6LUC/6	Newfoundland Radio			
W5CF/5	Club	145-	AB-8-	1128
	Toten Amateur Radio			
	Club	154-ABC-	9-	1068
	Great Bay Radio Assn.	133-ABC-	7-	1011
	Lowell Radio Operators			
	Club	327-	AB-16-	875
	Gaston County Ama-			
	teur Radio Club	325-	AB-9-	751
	Pioneer Radio Ama-			
	teurs	117-	AB-13-	711
	Central Massachusetts			
	Amateur Radio Assn.	101-	B-15-	606
	Penn. Central Radio			
	Club	282-ABC-	11-	479
	(nonclub group)	55-ABC-	55-	369
	Lakehead Amateur Ra-			
	dio Club	86-	BC-5-	306

Five Transmitters Operated Simultaneously				
W6CG/6	Royal Order of Suda-	1092-	A-20-	10,971
W2HVL/2	Radio Club	729-	A-30-	6786
W2ROJ/2	Watoune Valley Radio			
W38OB/3	Club	726-	A-25-	6759
W1AA/2	York Road Radio Club	746-	A-27-	6714
W6MGJ/6	Radio Success Radio	710-	A-19-	6669
	Club			
W7DK/7	Helix Amateur Radio	712-	A-14-	6633
W3NA/3	Radio Club of Tacoma.	604-	A-4-	5679
W9HA/9	DX Club	748-	AB-18-	5331
W8ACW/8	St. Clair Amateur Ra-			
	dio Club	695-	AB-15-	4428
	Genesee County Radio			
	Club	660-	AB-27-	4266
W6NCL/6	Skyriders	473-	A-15-	4251
W6KA/6	Pasadena C. D. Net	617-	AB-10-	4221
VE3BER/3	Clinton Amateur Radio			
	Club	443-	A-12-	4212
W2DPQ/2	Huntington Radio Club	584-	AB-25-	4164
W6PMI/6	Union Radio Amateur's			
	Club	466-	AB-9-	4056
W2GM/2	Albany Amateur Radio			
	Assn.	466-	AB-25-	3987
W6LUC/6	Santa Barbara Amateur			
	Radio Club	449-	AB-16-	3789
W5CF/5	Kiloxeely Club	547-	B-22-	3348

Five Transmitters Operated Simultaneously

W6CG/6	Royal Order of Suda...	1092-	A-20-	10-071
W2HVL/2	Nassau Radio Club	729-	A-30-	6786
W2ROJ/2	Watchung Valley Radio			
W38OB/3	Club	726-	A-25-	6759
W1AA/2	York Road Radio Club	746-	A-27-	6714
W6MGJ/6	Lake Success Radio			
W7DK/7	Club	710-	A-19-	6669
W3NA/3	Helix Amateur Radio			
W9HA/9	Club	712-	A-14-	6633
W8ACW/8	Radio Club of Tacoma	604-	A-23-	5679
W6NCL/6	DX Club	748-	AB-18-	5331
W6KA/6	St. Clair Amateur Ra-			
VE3BER/3	dio Club	695-	AB-15-	4428
W2DPQ/2	Genesee County Radio			
W6PMI/6	Club	660-	AB-27-	4266
W2GM/2	Skyriders	473-	A-15-	4257
W6LUC/6	Pasadena C. D. Net	617-	AB-10-	4221
W5CF/5	Clinton Amateur Radio			
	Club	443-	A-12-	4212
	Huntington Radio Clu-			
	b	584-	AB-25-	4164
	United Radio Amateur's			
	Club	466-	AB-9-	4056
	Albany Amateur Radio			
	Assn.	466-	AB-25-	3987
	Santa Barbara Amateur			
	Radio Club	449-	AB-16-	3789
	Kiloeyelet Club	547-	B-22-	3432

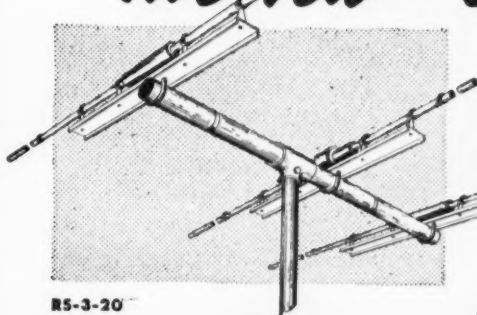
(Continued on page 136)

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WIMHL/1	Waltham Amateur Radio Assn.	345-	A-18-	3330
W7MXH/7	Cascade Radio Club	498-	B-14-	3138
W7DA/7	North Seattle Amateur Radio Club	440-	AB-18-	3084
W6LUF/6	Mount Diablo Amateur Radio Club	422-	AB-25-	2946
K6CFT/6	Burbank Civil Defense Radio Council	426-	AB-12-	2928
W4NVT/4	Jade Radio Club	382-	AB-22-	2718
W8KGG/8	Huron Valley Amateur Radio Assn.	436-	AB-29-	2649
VE2ADX/2	South Shore Amateur Radio Club	256-	A-20-	2529
W2NFI/2	Northern Nassau Amateur Radio Club	280-	A-	2520
W4HBB/4	Amateur Radio Club of Savannah	350-	B-20-	2250
W7YN/7	Nevada Amateur Radio Assn.	348-	B-10-	2238
W8RLV/8	Dial Radio Club	314-	B-15-	2034
W7WJ/7	Oregonian Amateur Radio Society	184-	A-16-	1881
W7KYC/7	Portland Amateur Radio Club	234-	B-10-	1554
W3CAH/3	Washington Radio Club	183-	AB-10-	1155
W8SG/8	Denison University Amateur Radio Club	166-	B-12-	1152
W2BNW/2	Trylon Radio Club	241-	AB-13-	543
WITAN/1	Rutland C.W. and Phone Radio Club	62-	AB-9-	140

Six Transmitters Operated Simultaneously

K6BAG/6	Pacific Radio Club	1270-	AB-17-	11065
W2VDJ/2	Lakeland Amateur Radio Assn.	1188-	A-21-	10917
W0PCS/0	York Radio Club	1151-	A-25-	10584
K6EM/6	Crescent Valley Radio Club	1013-	A-30-	9369
W2FUS/2	Morris Radio Club	843-	A-26-	7812
VE3ZM/3	Cuepich Amateur Radio Club	739-	A-30-	6876
VE3JJ/3	West Side Radio Club of Toronto (nonclub group)	760-	AB-25-	6738
K8AIR/8	Coronado Radio Club	767-	AB-25-	5397
W6MLL/6	Westchester Amateur Radio Assn.	638-	AB-22-	5319
W2GMM/2	Illinois Valley Radio Assn.	701-	AB-20-	5184
W9PZT/9	Framingham Radio Club	554-	A-20-	4986
W1GLA/1	Toledo Radio Club	449-	A-15-	4266
W8WF/8	Chicago Suburban Radio Club	435-	A-25-	4140
W9SW/9	Sacramento Amateur Radio Club	412-	A-20-	3933
K6ER/6	Lake Geauga Amateur Radio Club	419-	A-42-	3771
W8RNF/8	Submarine Signal Amateur Radio Club	616-	B-	3696
W1ECO/1	Confederate Signal Corps Brantford Amateur Radio Club	446-	AB-30-	3603
W4VTA/4	Browning School Amateur Radio Club	476-	AB-10-	3252
VE3HN/3	Fordham Radio Club	346-	A-19-	3114
W9TBT/9	North Central Indiana Amateur Radio Club	456-	AB-7-	3099
W2IN/2	Turlock Amateur Radio Club	357-	AB-34-	3018
W9LDT/9	Club	408-	AB-12-	2961
W6BXN/6	Johnson County Radio Amateurs Club	461-	AB-16-	2901
W6RHR/6	IBM Radio Club	331-	AB-42-	2682
K2CXP/2	Valley Radio Club	414-	B-18-	2484
W7PXL/7	Blue Grass Radio Club	412-	B-6-	2472
W4JP/4	Western Electric Amateur Radio Club	381-	AB-20-	2436
W8WD/9	Hamilton Township Radio Assn.	349-	AB-16-	2250
W2AVZ/2	San Mateo County Amateur Radio Club	336-	B-19-	2166
W6LMN/6	Toledo Mobile Radio Assn.	242-	AB-16-	1707
W8WIT/8		249-ABC-	11-	1146

Seven Transmitters Operated Simultaneously

W4FU/8	Ohio Valley Amateur Radio Assn.	1570-	A-20-	14355
W6LR/6	Lockheed Amateur Radio Club	932-	AB-60-	6789
W1WKN/1	Old Colony Amateur Radio Assn.	557-	A-17-	5256
W1AAT/1	Yankoe Radio Club	576-	AB-23-	4794
W4PCC/4	Blue Ridge Amateur Radio Society	525-	B-23-	3300
VE3RW/3	Quinte Amateur Radio Club	408-	AB-20-	3174
W6SDE/6	Corona Gang	323-	A-11-	2907

Eight Transmitters Operated Simultaneously

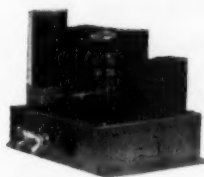
K6DTA/6	West Valley Radio Club	1420-	AB-25-	10473
W3RCN/3	Rock Creek Amateur Radio Assn.	1013-	A-64-	9342
W1OC/1	Concord Brasspounders	998-	A-20-	9099
W6TOI/6	Downey Radio Club	1284-	AB-30-	8550
W6OTX/6	Palo Alto Amateur Radio Assn.	947-	AB-27-	8292
K6EBN/6	Westchester Amateur Radio Assn.	1085-ABC-	30-	6738
W1NEM/1	Hartford County Amateur Radio Assn.	642-	A-45-	6057
W6FT/6	Oakland Radio Club	756-	AB-25-	6030
W6HIF/6	San Francisco Radio Club	861-	AB-35-	5790

(Continued on page 138)

**MOBILE
POWER**

PALCO

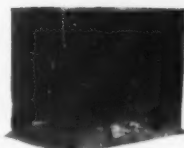
**MOBILE
POWER**



Model 606-6V Kit \$29.50
Model 612-12V Kit \$33.50

- ★ 500 V. DC 225 Ma.
- ★ No battery drain on standby
- ★ Instant start, stop -- no waiting
- ★ Communications type Vibrator
- ★ Small and rugged. Ship. Wt. 14 lbs.
- ★ Size 6 x 7 x 6 $\frac{3}{4}$. Mtg. plate 6 x 9

- ★ Complete power supply
- ★ 6 Volt input
- ★ Output power selector Sw.
Pos #1 500 V 225 Ma.
Pos #2 400 V 170 Ma.
- ★ Built in relay for remote control
- ★ On-off sw for local control
- ★ 700 Volt filter condensers
- ★ Extra heavy duty Vibrator



Model 6A \$39.50



- Elmac AF-67 Mobile Transmitter with
Palco Model 6A Power Supply \$226.50
- Elmac PMR-6A Receiver (less speaker) 134.50
- Elmac 6 or 12 V. Receiver Power Supply 24.50

Fast Delivery • Personal Service • Complete Stocks

Cornell-Dubilier Dictator Model 6/12D5

Designed to operate dictating machines or other AC devices such as shavers, phono turntables or small amplifiers in automobiles or boats. Delivers 110 V. AC 60 cycle power up to 50 watts continuously, and handles loads up to 75 watts on a short-time basis. Operates from either 6 or 12 volt battery.



AC
Power

Cornell-Dubilier D.C. to 110 V. AC Converters

TYPE	INPUT	WATTS OUTPUT	NET PRICE
6/12D5	6-V	50-75	\$26.53
6R10	6-V	100-125	40.25
12R8	12-V	80-100	28.37
12RU15	12-V	150-175	53.39
32R8	32-V	80-100	32.81
110R10	110-V	100-125	27.02

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PALCO ENGINEERING, INC.

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PRINTED CIRCUITS

PRINTED wiring TRANSMITTER

Complete Kit
Only \$9.95 Net

Wiring Entirely Printed!
Drop in the Parts and Solder
All Parts Supplied
Less Tubes and Crystal

Illustrated instructions supplied make this kit ideal for the novice. Now wiring errors possible. Use on either 80 or 40 meter bands. Uses 6C4 crystal oscillator and 9763 amplifier. Link output. Power requirements are 6.3 VAC/DC and 300 VDC.

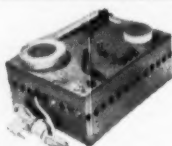
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or send check or money order direct
Mail orders sent prepaid

Kit of Printed Circuit Materials
Make Your Own Etched Wiring - \$4.95

LOMAR PRODUCTS Co.
WILLOW GROVE, PA.

PRINTED CIRCUITS

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K6AGF/6	Tri-County Amateur Radio Assn.	761-	AB-15-	5208
W6PMK/6	North Peninsula Electronics Club	464-	A-25-	4401
VE7AQL/7	British Columbia Electric Railway Amateur Radio Club	488-	AB-8-	4038
VE3DJ8/3	Niagara Peninsula Amateur Radio Club	508-	AB-30-	3882
W7NCW/7	Lower Columbia Amateur Radio Assn.	492-	AB-14-	3243

Nine Transmitters Operated Simultaneously

W9AP/9	North Suburban Radio Club	1445-	A-30-13,230
W9IT/9	North West Amateur Radio Club	1224-	A-37-11,241
VE3BRR/3	Nortown Amateur Radio Club	846-	A-38-7848
VE3DC/3	Hamilton Amateur Radio Club	836-	AB-28-7617
W6SY/6	San Francisco 29ers	897-ABC-35-	5025

Ten Transmitters Operated Simultaneously

W2LI/2	Tri County Radio Assn.	1958-	A-30-17,847
W2GSA/2	Garden State Amateur Radio Assn.	1979-	AB-40-16,899
W6UW/6	Santa Clara County Amateur Radio Assn.	1540-	AB-28-11,874
W6UF/6	Elmac Gang	1435-	AB-32-10,044

Eleven Transmitters Operated Simultaneously

W68C/5	San Antonio Radio Club	1255-	AB-28-10,113
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CLASS B

Grouped in this special listing are the scores of stations manned by one or two operators. Where two persons participated, the call of the assisting operator is given following that of the amateur whose call was used. Figures following the call listings indicate number of contacts, power and final score.

One Transmitter

W2JBQ/2	...	373-	A-5373	W0ADT/0	...	163-	C-489
W2FBA	...	191-	A-2916	W0SQN	...	53-	A-482
W5VRP/5	...	191-	A-2916	W7VU/7	...	133-	C-474
W5XFP	...	307-	A-2763	W6PFE/6	...	31-	A-419
K0WBB/0	...	238-	A-2547	VO1D/2	...	5-	A-405
VE3ICL/3	...	398-	B-2538	W6ID/5	...	43-	A-387
VE3ICL/3	...	278-	A-2502	W5UMY	...	187-	B-376
W6LRW	...	293-	B-2049	W0QEL/9	...	85-	A-321
W1RAN/1	...	305-	B-1980	W0NOH/8	...	24-	B-306
W1RCS	...	216-	A-1944	W8PIV	...	22-	A-297
W6RBU/6	...	169-	B-1764	W1XN/3	...	7-	B-288
W6VIG	...	123-	A-1661	W3TYC	...	22-	A-297
W3WPY/3	...	250-	B-1512	K2GFN/2	...	22-	A-297
W3VEJ	...	160-	A-1440	W4KX/4	...	48-	B-288
W3RZG/3	...	81-	A-1431	W7NXX/7	...	7-	B-288
W3PWK	...	133-	A-1422	W7T8M	...	20-	A-270
W5OG8	...	195-	B-1320	W1HID/1	...	133-	B-266
W2NCI/2	...	116-	B-1269	VE2JQ/2	...	48-	A-144
W2GNT	...	180-	B-1230	W5PIZ/5	...	10-	A-105
W0EIZ/0	...	120-	A-1080	W5TJT	...	6-	A-81
W9ESQ/9	...	54-	A-1067	W5NHC/9	...	23-	B-46
W9ESQ/9	...	223-	B-1066	W4DAF/8	...	5-	A-45
W9MQV/9	...	108-	B-972	W1ZZO/1	...	76-	B-909
W9DOH	...	46-	A-959	W1VHM	...	1-	A-18
VE2PQ/2	...	124-	B-909	W6ETW/6	...	2-	A-6
VE2PQ/2	...	65-	A-810	VE2IB	...		
VE3DOU/3	...	35-	A-810		...		
W7UN/7	...	61-	A-774		...		
W8OP/8	...	99-	B-744		...		
VE1AAM/1	...	48-	A-716		...		
VE1AAU	...	52-	A-702		...		
W5ZHA/5	...	26-	A-683		...		
W5APN	...	23-	A-648		...		
W5AER/5	...	106-	B-636		...		
W7IWI/7	...	19-	A-594		...		
W9PNE/9	...	58-	A-522		...		
W9OHI/9	...	83-	B-498		...		
W9OEY		
W9PAT/0		
W9YU/9		
W4ZWL/4		
W4ZSW		
W4NLI/9		
VE3DHT/3		
W4KAC/4		

Two Transmitters

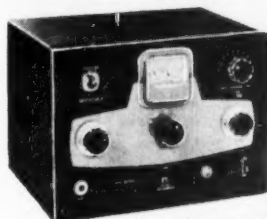
W6VIF/6	...	190-	A-2903
W6BYC	...	401-	AB-2835
W4KX/4	...	269-	B-1614
W4KCC/4	...	165-	A-1485
W4QCA/4	...	54-	A-486
W4SU	...	25-	B-50
W2HES	...		
W7SGD/7	...		
W7W/7	...		
W8JTB/8	...		
W8MYD	...		

(Continued on page 140)

SEASON'S GREETINGS FROM ALL AT TERMINAL

...For a Joyful Holiday
and a
Happy New Year

BRAND NEW 1955 HAM GEAR!



NEW! Johnson Viking ADVENTURER CW Transmitter Kit

Work round the world with the ADVENTURER... the perfect transmitter kit for both novice and experienced amateur. Completely self-contained.

- Power Input — 50 Watts • Effectively TVI suppressed
- Pi-network output tuning — no antenna tuner needed
- Single-Knob Bandswitching on 80, 40, 20, 15, 11 and 10 meters
- Extremely compact in size — only 7 3/4" high x 10 3/4" wide x 8 1/4" deep.

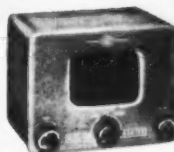
No. 240-181-1 VIKING ADVENTURER Kit with tubes, less crystals and key. Complete with easy assembly directions and operating instructions.

\$54.95

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these Famous JOHNSON Ham Favorites:—

Viking Ranger • Viking II • Viking VFO • Viking Mobile VFO • all in either Kit Form or factory wired • Johnson's Civilian Defense Viking II • Low Pass Filter • Standing Wave Ratio Bridge • Signal Sentry • Matchbox • Bi-Net and Whipload as well as Johnson parts. Contact W2BUS for information, data sheets and quotations.



NEW! GONSET Monitone MODEL 3022 3 Way Code Oscillator

No need to tie up dollars in an instrument which can be used only for code practice purposes. The NEW MONITONE is

a multi-purpose instrument — can be used three ways: Code Oscillator, Phone Monitor and CW Monitor. Has no shock hazard on the keying system. Can be used with any CW Transmitter to monitor code sending as well as transmitter keying characteristics. At the flip of a switch it can be used as a monitor for speech quality in conjunction with a radiotelephone transmitter.

Size 6 3/4" wide x 5 1/4" high x 4" deep
— 115 volt AC

\$19.50

NEW! Model 3057 GONSET 2 Meter DE LUXE COMMUNICATOR in 12 VDC/117VAC **\$229.50**

NEW! Model 3049 GONSET 6 Meter DE LUXE COMMUNICATOR in 6 VDC/117VAC **\$229.50**

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NEW! GONSET 500W 55B, AM or CW Linear RF Power Amplifier **\$395.00**

TERMINAL distributes all of GONSET'S Communications Equipment for Amateur, Commercial and Private Aircraft.

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A new complete Transmitter which, besides functioning as a regular Transmitter becomes a single sideband Transmitter at the twist of a knob.

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The newest and most complete line of HALLICRAFTER always available at TERMINAL: S-38-D • S-85 • S-86 • S-94 • S-95 • SX-62-A • SX-88 and SX-96. Write W2BUS for further information on availability and prices.



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This brand new Communications Receiver from the HALLICRAFTER Laboratories provides a new concept in Receiver performance in its price class.

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ELMAC AF-67 TRANS-CITER

The ELMAC AF-67 is a compact 60 watt input, fully AM modulated, 7 band, built-in VFO or crystal controlled transmitter. Since power supply is external, it is equally adaptable for use in car or home, or both. Too

many features to list, ask W2BUS for any additional dope you want. AF-67 Wired, tested with all tubes

All ELMAC Products Regularly Stocked.

\$177.00

PMR-6A — 6 Volt Receiver	\$134.50
PSR-6 — 6V Power Supply	24.50
PMR-12A — 12V Receiver	134.50
PSR-12 — 12 V Power Supply	24.50
PSR-116 — 117 VAC Receiver Power Supply	24.50
PSR-116S — ditto with "S" Meter	35.50
PS-2V — 117 VAC Power Supply for AF-67	49.50
CFS-1 — Cable Kit	4.75
PTR-1 — Push to Talk Kit	6.75

NATIONAL NC-98 RECEIVER

An outstanding, sensitive receiver of advanced circuitry. Full 550 kc to 40 mc coverage. Special features include: Crystal Filter • S Meter • Calibrated Electrical Bandspread on either S Meter or SWL Bands • 1 RF Stage • 2 IF Stages • Slide Rule Dials • Antenna Trimmer • Noise Limiter • Provision for Narrow Band Adapter • Separate HF Oscillator.



\$149.95

Complete line of

NATIONAL

Regularly Stocked

NC-88 \$119.95

NC-125 \$199.95

NC-183D \$399.50

HR0-60T \$533.50

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**SPRINGER MODEL ARSG
SIGNAL GENERATOR
NOISE DIODE TYPE**

Length—6½" Dia.—1½" Weight—12 oz.

- Self contained, operates with Burgess Z4, 6 volt battery.
- Ideal for receiver sensitivity checks and "Touch Up" alignment to improve signal to noise ratio of AM receiving equipment.
- Generator signal output connection provided thru 24" length of 52 ohm concentric line.
- Average maximum signal output level of generator is 15 microvolts.
- Calibrated linear dial provided for output control.

EARL W. SPRINGER AIRCRAFT RADIO CO.
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Evans RADIO

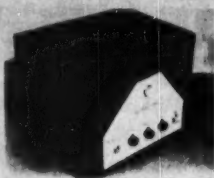
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by hams. Nationally accepted brands of parts, tubes and equipment. Trade-ins and time payments. Write W1BFT.
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CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

K6ARK/6	238-A-3551	W8GHO/8	29-A-729
W8HFE/8	146-A-3470	W8QU/6	6-A-675
W8AFI/8	213-A-2576	W7YV/7	25-A-675
W8AJH/8	91-A-2727	W8ZEU/8	25-A-675
W8AJW/8	77-A-2727	W8EPX/6	5-A-662
W8NQZ/6	172-A-2673	W7NVY/8	49-A-662
W6QGF/6	102-A-2538	W8AGA/8	24-A-662
W8MW/8	71-A-2457	W9QZ/9	23-A-662
W8ERA/8	68-A-2417	W9YRF/9	24-A-662
W8NW/8	42-A-2363	W8HFW/8	14-A-640
W6OL/6	149-A-2549	W6THC/6	46-A-635
W8QAV/8	62-A-2336	W8LEX/8	22-A-635
W8HDE/8	57-A-2268	W9AYI/9	22-A-635
W8PM/8	55-A-2268	W9MYI/9	20-A-635
W9RQM/9	142-A-2268	W3KKH/3	21-A-621
W8VK/8	54-A-2228	W3VAG/3	21-A-621
W8NO/8	52-A-2201	W6KMI/6	2-A-621
W8JNE/8	53-A-2187	W7MSI/7	20-A-608
W8YPE/8	51-A-2187	W3NKY/3	17-A-594
W6HDT/6	136-A-2174	W6LMQ/6	2-A-594
W6RO/6	135-A-2174	W8RDF/8	19-A-594
W8ZJQ/8	50-A-2174	W7OEN/7	17-A-581
W6TSA/6	160-A-2160	W6CKR/9	18-A-581
W8GHT/8	49-A-2160	W7JMD/7	11-A-567
W6ZVD/6	133-A-2147	W7OTA/7	17-A-567
W8CZM/8	48-A-2147	W7RT/7	17-A-567
W8FKB/8	54-A-2147	W7CBE/7	15-A-540
W8NNG/8	42-A-2066	W8LPE/8	19-A-540
W8MYM/8	41-A-2052	W3ESM/3	12-A-500
W8NNC/8	41-A-2052	W7HRC/7	12-A-500
W8MCK/8	56-A-2039	W8JJE/3	11-A-486
W8ZXL/8	40-A-2039	W7MI/7	10-A-486
W8IWP/8	38-A-2012	W3JAS/3	10-A-473
W8AFW/8	38-A-1985	W3EQK/3	15-A-459
W8LHJ/8	38-A-1985	W8MNS/8	2-A-446
W8NLI/8	35-A-1971	W3FRD/3	8-A-446
K6DSM/7	105-A-1950	W3GBB/3	8-A-446
W8LKR/8	33-A-1944	W8LPE/8	8-A-446
W8MAE/8	37-A-1944	W8MNS/8	46-B-432
W8NZL/8	33-A-1944	W3PSQ/3	7-A-432
W8KHM/8	32-A-1931	W7QGF/7	3-A-432
K6IDA/6	141-A-1904	W8MDI/3	31-A-419
W6HHB/6	109-A-1809	W3KIU/3	3-A-378
W6JRP/6	106-A-1769	W8UQV/3	28-A-378
W6OAY/6	100-A-1688	W3NPI/3	2-A-365
W3FMG/3	61-A-1647	W4TRF/8	1-A-351
W6RKC/6	182-B-1638	W7JWE/7	1-A-351
W6JOM/6	77-A-1620	W8AJZ/8	1-A-351
W6FTX/6	91-A-1593	W8BUI/8	1-A-351
W8MIN/8	31-A-1566	W8INH/8	1-A-351
W6EIG/6	115-A-1553	W8NQG/8	1-A-351
W7PCY/7	30-A-1553	W8QYM/8	1-A-351
W5CTG/5	73-A-1523	W7MMS/8	1-A-351
W6INN/6	69-A-1296	W8WAE/8	1-A-351
W6FJE/6	70-A-1283	W2KTE/2	24-A-324
W6GHL/6	67-A-1256	W8KZM/8	32-A-311
W7BA/7	67-A-1242	W8RKE/9	22-A-297
W6HHG/6	62-A-1229	W7YB/1	23-B-288
W6GAL/6	45-A-1215	W6HYN/6	20-A-270
W6GHD/6	64-A-1204	W7LJM/1	2-B-270
W6JJE/6	60-A-1148	W6EY/6	25-B-225
W6OLY/6	50-A-1121	W3FXG/3	16-A-216
W7PCY/7	58-A-1121	K2BGR/2	16-A-216
W7KZP/7	58-A-1121	W7OCW/7	14-B-189
W3FDJ/3	56-A-1094	W6QGO/6	13-A-176
W3VLL/3	53-A-1053	W2ZAL/2	12-A-162
W4HIS/4	78-A-1053	K2BGR/2	18-B-162
W9YWF/9	49-A-1026	W2IHE/2	11-A-149
W9GFA/9	47-A-972	W0DEL/0	11-A-149
W9QHL/6	24-A-959	K6CET/6	10-A-135
W7FTR/7	45-A-945	W8NY/8	12-B-108
W3BII/3	42-A-905	W1AGR/1	7-A-95
W3QLG/3	19-A-837	K6DGD/6	7-A-95
W9QHL/6	16-A-810	W9DLM/9	10-B-90
W6NZP/6	12-A-783	W8LHK/6	6-A-81
W6KTS/6	13-A-770	W1IHL/1	5-A-68
W9EZR/9	31-A-770	W8CBM/8	5-A-68
KN6EKY/6	31-A-770	W0LQV/0	7-B-63
W7PZT/7	25-A-729	W8ABL/0	4-A-64
W7RTQ/7	29-A-729	W4NHS/4	2-A-27

CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

W8SVE	74	W1ZEO	25
KN6DGN	27	W1WZN	13

CLASS E

Grouped in this tabulation are the scores of home stations operated from commercial power sources.

W4KFC/4	833	W8TZO	129
W4ZJB/4	308	W1UBC/6	113
W4YJS/4	280	K2DEM	113
VE1ZZ	242	K6CWX	104
W6HJ/6	200	W9AEM	102
W1WFE	186	W2KHQ	97
W2APH	182	W7LXY/7	95
W3TNO	151	W2ZCZ	88
W1AW	140	K6RAM	83
VE3DFM	130	W6UCG	78

(Continued on page 142)

CQ
= :: =

W3HWZ



M. R. BRIGGS, A HAM OPERATOR FOR 35 YEARS, IS MANAGER OF MISSILE
GROUND CONTROL ENGINEERING, WESTINGHOUSE ELECTRONICS DIVISION

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25 WATTS \$19.95

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WIZDX	74	WNABXV	12
K6EA	70	WTJAZ	12
WIAPM	69	W7NWP	12
W3HVM	69	WITXL	11
W3HIV	67	W5RHT	11
K2DIM	67	W3VZL	11
W8KID/8	64	W4DRT	11
W4MG	62	W58QHW	11
W1WMH	57	W6PHE	11
WIZBL	55	W6PWO	11
W2TYC	53	W3BNU	10
K6ATN	52	W6DKN	10
K2EKS	50	W7UZR	10
W6AM	49	WICTR	9
W2UE/3	48	WIMEP	9
W3WAF	48	WARKN	9
K5NRC	46	W8NEM	9
W1LIG	45	W9CHD	9
W4KX/8	45	K6CUM	8
W8RJX	45	KN6EDI	8
W3WCP	44	W2BXM	7
K2CJQ	44	W2GVV	7
V13HCR	43	W6JRK	7
W8DAE	38	VE7WL	7
K2EWR	36	W2OAE	6
VE2IL	35	W3WNH	6
KV4BD	35	W2WJ	6
W6NAZ	32	W8VFM	6
W6ZOL	31	VE1VN/1	6
W1ZCH	27	W1YDH	5
WN1ZUM	27	W2HAZ	5
W3PQE	27	W2JCP	5
K58DVA	27	W5BHR	5
W2BFN/2	26	W6JWJ	5
K2GBM	26	K2ENO	5
W588X	26	KN6CNI	5
W6KCA	26	W1WJ/6	4
W3MDE	25	W1MGP	4
W8CCT	22	W2ZAL	4
W3YJL	21	W3AHM	4
W8RDM	20	W8JEM	4
W1AJX	19	W3UTR	3
W6JDN	19	W7ALI	3
W6VLW/8	18	W1BR/1	2
W9VJD	18	W1RPQ	2
W3WKP	17	W4WYA	2
W1PDN	16	W7PSS	2
W3YNZ	16	W5WVL	2
W5BLA	16	W9ALO	2
W1WLZ	14	W9CLH	2
W2CVW	14	W6PDK	2
WN9BCO	14	KN6DGE	2
W2QFH	13	W2HY	1
W2TNC	13	W2OTZ	1
K2IDG	13	W4GDD	1
W1LXE/3	12	W8OTGC	1
W3VKD	12	KN6DDO	1

¹ W4 BMQ MYN, ops. ² K6KHT, second opr. ³ W6TEN, second opr. ⁴ W9RLB, second opr. ⁵ W6EHA, second opr. ⁶ W5DAH, second opr. ⁷ W4WWO, second opr. ⁸ W3FWZ, second opr. ⁹ W4S AEL EIS FKA GPF MFJ PZW. W4S HGN JA KFC NTZ PNR TFX TRH LD, ops. ¹⁰ W6HIC, second opr. ¹¹ W1WPR, ops. ¹² W4ARH, second opr. ¹³ KN6DYP, second opr.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1FWH, Walter E. Bradley, Hartford, Conn.
W1HXE, Paul W. Muller, Salem Depot, N. H.
W1QPR, Thomas P. McDonald, jr., Beverly, Mass.
ex-W2BAG, F. Austin Lidbury, Niagara Falls, N. Y.
ex-W3EFA, Henry P. Wagner, Catasauqua, Penna.
W4SEZ, Buell Vincent, Franklin, Ky.
W4TUT, Mayor Ivan C. Kelly, Somerset, Ky.
W4ZQZ, George H. Seaborg, Spartanburg, S. C.
W5BR, ex-W5DNN, ex-HC20T, H. E. M. Stevenson, Houston, Texas
W5LHF, Ralph A. Grogan, Fort Worth, Texas
W6JCE, Earl P. Patrick, Coronado, Calif.
W7PZA, Francis T. Clodfelter, Corvallis, Ore.
W8BPH, William Everett Jones, Chillicothe, Ohio
W8DDL, Thomas Thomas, Dayton, Ohio
W8MUL, John J. Messler, Detroit, Mich.
WN9DLB, Harold W. Davis, Libertyville, Ill.
W8CRM, B. F. Piper, West Plains, Mo.
W8DRW, Frank J. Whalen, Kansas City, Mo.
W8JVD, Walter W. Soderman, Duluth, Minn.
W8LVG, John R. Lally, Minneapolis, Minn.
W8VQN, Aaron G. Brehmer, Scottsbluff, Nebr.
VE3AVP, William J. Godsman, Clarkson, Ontario

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1200 FT. REEL
Genuine Plastic Base
RECORDING TAPE
Shpg. Wt. 14 oz.

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A terrific value! High impedance mike with —55 db output level. Compact, modern, slim styling. Contains W.E. 252A magnetic head and UTC ouncer. Silver plastic casing with detachable desk stand. Lightweight — only 11 ounces. Complete with 6 ft. cable.

PA-23..... Net 3.95

CARDWELL UHF CONVERTER SALE!

List **42.50**

Net **13.95** ea.
Lots of 3

Singly **14.45** ea.

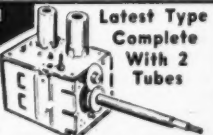
Outstanding Value! The Cardwell ES-1 UHF converter covers the entire UHF spectrum—channels 14-83. Has 6AF1 oscillator, 6CB6 IF amplifier and 1N27 crystal diode. Features printed circuit oscillator, high overall gain (3 to 4 times), high sensitivity, constant L/C ratio-tuner, 25-1 gear drive. Has AC cord and plug, 3-pos. switch for UHF, VHF and OFF. Handsome wood cabinet 8 1/2 x 6 1/2 x 3 1/2" with easy reading dial. Shpg. Wt. 4 1/2 lbs.

CARDWELL ES-1 Converter—Lots of 3 each.....13.95
Singly each.....14.45

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Brand new—covers entire VHF spectrum. It is an exact duplicate of thousands now in use in many chassis including the Sylvania 510 and 520 series. Has 7" long concentric shafts. Excellent gain, noise factor, image and I.F. rejection. For 40 mc IF systems. Complete with 6BC6 and 6X8 tubes and shields. Shpg. Wt. 4 lbs. Worth 3 times the price!

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11 Pieces—Fitted Felt-Lined Case Made in Germany, of heavy brass, nickel plated and polished. Instruments include 3 1/2" Compass with pencil and pen points and lengthening bar, 5 1/2" Divider, three 3 1/2" sidehead bow dividers with needle point, pen point and pencil point. 5" Ruling pen, extra handle for pen or pencil, capsule with extra leads. Interchangeability of these many parts makes this an exceptionally versatile set. Your money back—if this set is not worth twice our price!

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This instrument is one of the best buys that Lafayette has ever offered in a Wide Range AC-DC MULTITESTER. An ideal portable unit that meets the need for a compact, yet rugged test instrument. Has ease of operation usually **FOUND ONLY IN MORE EXPENSIVE INSTRUMENTS.** Has 1000 ohms/volt sensitivity on both AC or DC. Uses full 3" rectangular meter with large, easy to read scale. Uses 1% precision resistors, leveled D'Arsonval microammeter movement. Ranges: AC-DC and output volts 0-5, 0-25, 0-250, 0-1000V; DC current 0-1, 0-10, 0-100, 0-1000 mA. Resistance 0-10K and 0-100K ohms. In handsome sturdy bakelite case. Size: 4 1/2" x 3 1/4" x 1 3/8". Supplied complete with test leads and batteries. A Must for every serviceman, shop, Laboratory or experimenter—and at Lafayette's Price you can afford to own one. Shpg. Wt. 2 1/2 lbs.



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IMPORTED DIRECT PRISM-COATED LENSES BINOCULARS

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49¢ each — 10 for \$4.00

370	393	414	436	458	520	400	459
372	394	415	437	459	522	440	461
374	395	416	438	460	523	441	462
375	396	418	441	503	525	442	463
376	397	419	443	504	526	444	464
377	398	420	444	505	527	445	465
379	399	422	445	506	529	446	466
380	402	423	446	507	530	447	468
381	403	424	447	508	531	448	469
383	404	425	448	509	533	450	470
384	405	426	449	511	534	451	472
385	406	427	451	512	536	452	473
386	407	429	452	513	537	453	474
387	408	430	453	514	538	454	475
388	409	431	454	515		455	476
390	411	433	455	516		456	477
391	412	434	456	518		457	479
392	413	435	457	519		458	480

99¢ each — 10 for only \$8.00

CR-1A	FT-171B	BC-610
SCR 522-14		Banana Plugs
1/2" SPC		5/8" SPC
5010 7350	2030 3220	2360 3282 3850
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6450 7390	2060 3260	2415 3237 3955
6470 7400	2082 3282	2435 3258 3995
6497 7500	2102 3290	2442 3322
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6547 7930	2162 3305	2545 3520
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Special — 200 K.C. or 500 K.C. in FT-261A Holder only \$1.79 each

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FT-243 — .003" Pin Dia. — .006" Pin SPC for Ham and General Use.

49¢ each — 10 for \$4.00

4035	5437	5958	6800	7825	7825
4060	5485	5973	6806	7840	7900
4105	5500	6240	6825	7841	7950
4196	5646	6250	6850	7850	7973
4280	5675	6273	6875	7873	7975
4300	5706	6275	6900	7875	8260
4330	5760	6300	6925	7900	8273
4391	5725	6325	6950	7906	8275
4490	5840	6350	6975	7925	8300
4495	5870	6373	7450	7940	8325
4535	5773	6375	7473	7950	8630
4735	5780	6400	7475	7973	8683
4840	5806	6400	7500	7975	8690
4930	5840	6425	7500	7980	
4950	5852	6473	7525	7825	
4980	5873	6475	7540	7840	
5030	5875	6700	7550	7850	
5205	5880	6706	7573	7873	
5300	5906	6725	7575	7875	
5385	5925	6750	7600	7900	
5379	5940	6775	7600	7906	

99¢ each — 10 for \$8.00

1015	6125	6600	7175	8075	8475
2125	6140	6625	7250	8100	8500
3660	6150	6625	7300	8125	8525
3735	6175	6640	7306	8140	8550
3800	6200	6650	7325	8150	8575
3885	6440	7000	7340	8173	8600
3940	6450	7025	7350	8175	8625
3955	6473	7050	7375	8200	8650
3980	6475	7073	7400	8340	8700
4000	6500	7075	7425	8350	8733
6025	6506	7100	7440	8380	
6050	6550	7125	8000	8400	
6075	6573	7140	8025	8425	
6100	6575	7150	8050	8450	

BC-746

TUNING UNITS

Channels 10 and 12
Foundation coils and condenser
for 80 meter VFO or oscillator — Less state — **98¢**

Novice Round-up

(Continued from page 51)

2) Time: All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) QSOs: Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80-, 40-, 15-, or 2-meter bands. Crossband contacts are not permitted. C.w. to 'phone, c.w. to c.w., 'phone to 'phone, 'phone to c.w. contacts are permitted. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) Scoring: Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this QST) worked during the contest is the "section multiplier." A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Round-up report a copy of qualifying run from W6OWP, December 4th or January 7th, or from WIAW, December 16th or January 14th. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) Reporting: Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Round-up reports become the property of ARRL and must be postmarked not later than February 14th, 1955.

6) Awards: A certificate award will be given to the highest-scoring Novice in each ARRL section.

7) Disqualifications: Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. ARRL Contest Committee decisions are final.

Happenings

(Continued from page 53)

What is the formula for calculating total inductance when two or more inductors are connected in series? In parallel?

What is the formula for calculating the reactance of an inductor?

What is the formula for calculating the reactance of a capacitor?

What is the formula for determining the total resistance of two or more resistors connected in series? In parallel?

What is the formula for determining the total capacitance of two or more capacitors connected in parallel? In series?

What is the formula for determining the characteristic impedance of an air-insulated parallel conductor transmission line?

What is the formula for determining the standing wave ratio in a transmission line?

What is the formula for determining the wavelength of radio waves?

What is the formula for finding the resonant frequency of a tuned circuit?

In a series-resonant circuit, if the value of inductance is kept constant, what must be done to the value of capacitance to double the resonant frequency?

In a series-resonant circuit, what must be done to the value of the inductance-capacitance product to halve the resonant frequency?

Draw a schematic diagram of a high-pass filter with constant- k pi section, balanced type.

Draw a schematic diagram of a low-pass filter with constant- k pi section, unbalanced type.

Draw a schematic diagram of an r.f. power amplifier stage using parallel feed.

Draw a schematic diagram of a wavemeter with an indicating device.

Draw a schematic diagram of a Colpitts oscillator circuit.

(Continued on page 146)

AN/APR-4 COMPONENTS WANTED

In any condition. NEW HIGH PRICES. Also top prices for ARC-1, ARC-3, APR-1, APR-5A, etc.; TS-34 and other "TS-" and standard Lab Test equipment, especially for the MICROWAVE REGION; ART-13, BC-348, BC-221, LAE, LAF, LAG, and other quality Surplus equipment; also quantity Spares, tubes, plugs and cable.

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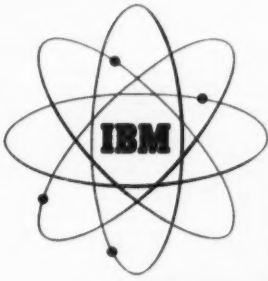
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RADIO-LABORATORY MAN

Need experienced lab man for amateur pre-production prototype work. Receiver-transmitter VHF experience necessary. Submit full qualifications in first letter.

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positions open for*

TECHNICIANS

With a background in

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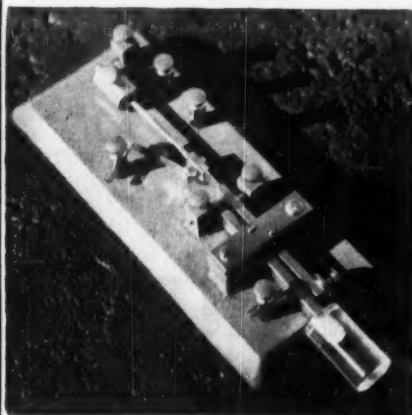
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FOR USE IN THE NEW 12 VOLT IGNITION SYSTEM
AUTOMOBILES. HIGHEST EFFICIENCY METHOD
USED, NO EXTERNAL EQUIPMENT NEEDED. ALL
ORIGINAL FEATURES RETAINED.

NEW 12 VDC/115 VAC COMMUNICATOR
IMMEDIATE DELIVERY F.O.B. LA. \$219.50
CONVERSION OF YOUR OWN COMMUNICATOR
INC. MATERIAL AND LABOR, F.O.B. LA. **\$24.50**

PACIFIC ENGINEERING CO.

839 N. June Street Los Angeles 38, California

"ITV" FILING

At its May meeting, the ARRL Board of Directors voted to file comment in Docket 9288 supporting the action of the Federal Communications Commission in proposing maximum radiation standards for certain devices such as television receivers. The text of the League's filing follows:

FEDERAL COMMUNICATIONS COMMISSION Washington, D. C.

In the Matter of

Amendment of Part 15 of the Commission's Rules Governing Restricted Radiation Devices } Docket No. 9288

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 12 of the Notice of Proposed Rule Making in Docket 9288, the American Radio Relay League files these comments on behalf of the more than 42,000 licensed amateur radio operators who are members of the League.

The interest of the American Radio Relay League in the present proceedings arises from the fact that stations in the amateur service have, since the inception of television broadcasting, been plagued with disruptive interference due to spurious radiation from television receivers. The amateur service is undoubtedly the single communications service most adversely affected by this unnecessary interference, inasmuch as amateur stations are located almost exclusively in residential areas; in other words, the distribution of television receivers follows closely the distribution of amateur stations in any particular area.

The American Radio Relay League has heartily supported the past actions of the Commission in dealing with this general problem, and endorses the present effort of the Commission to require manufacturers of television receivers to turn out products which are in reasonable conformity with the necessities of their users to live harmoniously together with other services provided for under international treaty and licensed by the Commission.

The League wishes to record its appreciation of the efforts made by the Radio-Electronics-Television Manufacturers Association, through its committee, to bring to the attention of manufacturers the need for better receiver design and construction to meet today's spectrum requirements. While the proposals of the Commission for maximum radiation limits, which we assume are based on the Association's recommendations, will not by any means solve all of the problems of interference to the amateur service and therefore leave much to be desired, they are a step in the right direction. The League is pleased to see that the Commission, in Paragraph 10 of its Notice, recognizes this fact and indicates an intention of progressing to stricter limits as may be required to protect the various services it licenses.

AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

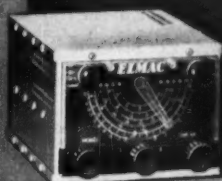
A. L. BUDLONG
Its General Manager
October 9, 1954

FEED-BACK

In the caption under the diagram of the CD-10-TC 10-meter transmitter-converter on page 33 of the November issue, the references to the crystals, X_1 and X_2 are reversed. X_2 , of course, is the converter crystal.

In the article describing the mobile modulator, starting on page 21, the length of the chassis is given as $6\frac{1}{2}$ inches. This dimension should be $6\frac{5}{8}$ inches.

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(Continued from page 68)

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(Continued on page 158)

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Topping their recent 20 meter "Mini-Beam" design achievements, TELREX now announces 3 new "Beamed Power—Perfect Match" 40 meter arrays.

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MODEL 402—
2 Element—40 Meter Full Size 3'x13 ft. reinforced dual boom. 1/2 wave elements. 5.6 db gain; 16 db F/B ratio. 52 ohm co-ax feedline. Wgt. approx. 60 lbs. **NET \$275.00**

MODEL 403—
3 Element—40 Meter Full Size 3'x29 ft. reinforced dual boom. 1/2 wave elements. 8.3 db gain; 19 db F/B ratio. 52 ohm co-ax feedline. Wgt. approx. 92 lbs. **NET \$330.00**
Write for free spec sheet describing these and other popular TELREX beam antennas

ROTATE YOUR BEAM



FOR ONLY... **\$5.95**

Attach your beam to this heavy duty turntable — put it on top of your pole, tower, or roof — run light rope or cable from your shack or window up to the ends of the flexible drum cable—and you can turn your beam a full 360°!

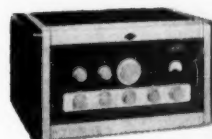
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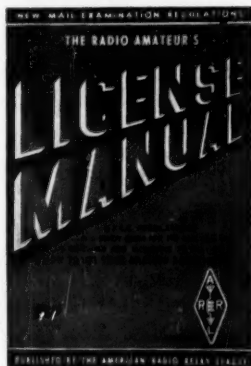
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An Open Letter to Hams About Antennae

(Refer to page 121 — Oct. '54 issue — QST)

WE HAVE been told in many ways that our rig is no better than the skyhook we tie it to. We try for maximum transfer of energy for transmitting as well as for receiving the other o.m.! These are true facts and especially vital to us, but we string up the best wires we can regardless of their effect upon one another because we want to work more than one band — especially when one goes out! What then is our problem? To design and build a *SINGLE* antenna which shall be erected in the smallest possible space over the best ground we can produce; which will give us maximum transfer of energy for both transmitting and receiving; using one feed line; and enable us to work not one, but four or more bands without loading coils or capacitors at the antenna; without special relays; or *WITHOUT HAVING TO MAKE ANTENNA ADJUSTMENTS!* This would be the ideal skyhook, especially in most cases, if the radiation could be the same in all directions. It sounds *IMPOSSIBLE*. But it is being done *now* through a principle known as *ELECTROMAGNETIC DECOUPLING* and these antennae are available to you in six different models at a far lower cost than you could produce your own even if you had a complete workshop and the many different materials required!

ONE of the antennae, for example, is the A.E.C.'s V-37 which comes in two models — Deluxe and Economy. With this antenna, several ground radials and 50-ohm coax you are *AUTOMATICALLY* on 75/80, 40, 20, 15, 11 and 10 meters as fast as you can change your transmitter — and with absolutely no adjustments of any kind at the antenna!

THE price for the Deluxe V-37 is \$299 while that of the Economy V-37, where you supply guy-wires, radials and other immediately-available material (which you may already have) is \$199! The rest of our story is told on Page 121 of the October issue of QST. Write us. You'll be glad you did!

ANTENNA ENGINEERING CO.

5021 West Exposition Boulevard
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We are seeking alert amateurs who own our antennae to tell our story (including the Engineering Service we supply to all owners), to other interested amateurs in their own communities and we expect to pay well for this service. It can be a most profitable part-time occupation for you, and we suggest you communicate with us at once for the very interesting and important details we have for you as our sales-representatives.

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Amperex JAN-type 5894

Special Features that make this tube the
OUTSTANDING SELECTION IN ITS CLASS

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- Zirconium coated molybdenum anodes for high overload capacity and lifetime gettering action.

The 5894 is a UHF and VHF twin tetrode for wide-band operation, RF amplifier, modulator, frequency multiplier service and wide-band oscilloscopes. Considerably reduced capacities provide higher resonant frequencies. Single cathode and screen grid construction results in low RF degeneration, therefore low drive required. Self-neutralized over entire band. Only 4" x 1 1/4". This tube has proved to be outstanding with 5 years of actual mobile operation.

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ANODE DISSIPATION...45 watts
HALF FILAMENT BATTERY DRAIN
ON "STANDBY"

ACTUAL MEASURED POWER OUTPUT PUSH-PULL OPERATION

144 Mc.....85 watts
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420 Mc.....60 watts



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Replaces old type 4-125A. Features heavy, zirconium coated graphite anode for high overload capacity. Powdered glass stem for strength eliminates external "heat-trap" base.

Amperex type 6156—Tetrode

Replaces old type 4-250A. Same features as 6155. Proven outstanding in high frequency communication and amateur service.



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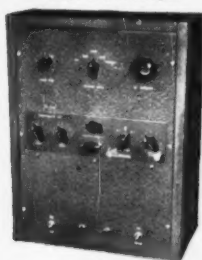
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I GOT BIT BY THE SINGLE-SIDEBAND BEE!

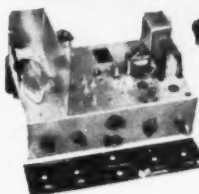


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Class B Linear Amplifier



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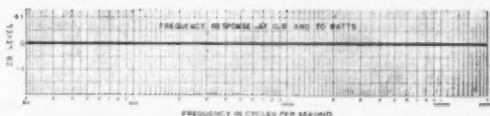
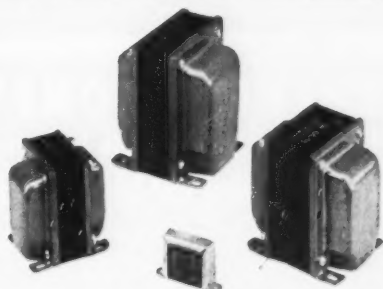
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New **FREED** COMPONENTS for HI-FIDELITY AMPLIFIER PROVIDE IMPROVED PERFORMANCE

This Freed circuit incorporated several changes from the original Williamson circuit to provide optimum performance at high and low frequency extremes. It is rated at 10 watts with triode connected output tubes. However, by connecting the screen grids of these tubes to taps provided on the Freed KA-10 output transformer, it is possible to double the power output for a given distortion percentage. Recommended power supply is choke-input type with a two-section L-C filter to maintain constant D.C. output and to improve filtering to the voltage amplifiers.

The required 550 volts AC for the rectifier can be furnished by a Freed KP-10 power transformer.

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- FREED KA-10 OUTPUT TRANSFORMER
- FREED KC-10 FILTER REACTOR
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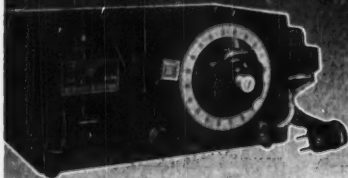
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REGENCY Division of I. D. E. A., Inc., Indianapolis 26, Ind.

AMATEUR NET ONLY 99c

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Commercial Mobile-Radio Maintenance with
2nd Class Ticket and LAMPKIN METERS!**



LAMPKIN 105-B MICROMETER FREQUENCY METER. Heterodyne type, uses only one crystal to measure all transmitters 0.1 to 175 mc., crystal-controlled transmitters to 500 mc. Precision CW signal generator for receiver final alignment above 20 mc. Weight 12½ lbs. Width 13". Price \$220.00.

**NOW Check Frequency
and FM
swing to 500MC!**

**MAIL
COUPON
TODAY!**



LAMPKIN 205-A FM MODULATION METER. Tunable 25 to 500 mc. in one band. Direct indication of peak voice deviation, 0-25 kc. positive or negative. Relative field-strength meter. Built-in speaker. Weight 14 lbs. Width 12¼". Price \$240.00.

LAMPKIN LABORATORIES, INC.
Mfg. Division, Bradenton, Florida

Please rush me more dope on the 105-B and 205-A.

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Address _____

City _____ State _____

LAMPKIN LABORATORIES, INC. BRADENTON, FLORIDA

3 NEW STARS in the ANTENNA SKY

Q MASTER

DUAL BAND
20 - 15

Q MASTER
SUPER

Bridge-type Truss
Construction for Strength,
Light weight,
Low Q
Telescoping
Tuning Stub

WRITE FOR
BROCHURE

Call Jim Halliday, W7QJ on 15 or 20

COMPACTED PRE-TUNED BEAMS

	Q MASTER Twin EL	*Q MASTER Tri EL	****Q MASTER Super
No. of Elements	2	3	4
Approx. Forward Gain*	4.8db	7.4db	8.7db
Approx. F. & B. Figure	15db down	26db down	35db down
Overall EL Length Beam	15'	15'	24'
Approx. Weight	12.5 lbs.	18.0 lbs.	28.0 lbs.
Price	\$39.50	\$78.50	\$99.50

* As measured against reference dipole.

Q MASTER beams are the NEW concept of multi-element antenna design. All elements are dual-conductor, truss designed, making for light weight, great strength and broad-band electrical properties, making possible large frequency excursions while maintaining a relatively low standing wave ratio change. All insulation is of Polystyrene or Poly-ethylene. Double booms are diagonally braced for stability. All three Q MASTER models may be used on both the 15 or 20 meter bands. All models PRE-TUNED — For complete details, write for brochure.

"BETTER BY RESEARCH"

Halliday Morda Company

Salem
Oregon

Be *Sure* of Your Transmitter to Antenna Match with the new **CoAx Ratiometer** (S.W.R.)

Install a CoAx Ratiometer in the line between your transmitter and antenna (or tuner) and stop guessing at a proper match. In this new device, well-established principles are applied to produce a unique answer to the problem of measuring standing wave ratios. The result is a design of exceptional accuracy and simplicity.

There are no condensers to balance, no resistors in line to dissipate your power. The unit handles frequencies from 2 to 200 MCS, power loads from 10 to 1000 watts (so it can't be overloaded). Rugged construction, but so compact it can easily be permanently installed inside your transmitter. Free mounting bracket included with every unit.

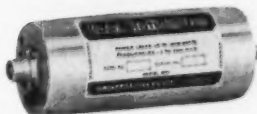
Sensing unit may be purchased with or without the easy-to-read remote indicator. Complete instructions include how to make your own remote indicator. See your favorite distributor today. If he hasn't heard about the CoAx Ratiometer, send us his name and your check. We'll ship direct to you, postpaid.

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UNIVERSAL SERVICE

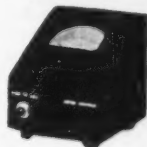
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Columbus 15, Ohio



Model KW-4
Specify 52 or 72 Ohm
CoAx Unit and Switch Box

\$27.50



Model KW-4M
Specify 52 or 72 Ohm
CoAx Unit with Meter

\$47.50

Full One Year Warranty
on Both Models

The
Christmas Gift
that
Lasts All Year
QST

He won't turn up his coat collar to
hide it.
He won't have to exchange it for one
with longer sleeves.
He won't read it once and shove it
out of sight.
It won't shrink.
And he'll like it whether he smokes
or not.

**QST is the one present that's always
suitable, always welcome—a monthly
reminder that you think enough of him to
give him something he really wants.**

Twelve issues of QST and a year's membership in
A.R.R.L.

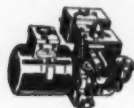
\$4.00 in U.S.A. and Possessions
\$4.25 in Canada
\$5.00 elsewhere

Of course the Christmas Card we mail him shows
that the gift is from you

AMERICAN RADIO RELAY LEAGUE
38 LaSalle Rd. West Hartford 7, Conn.

BUY DIRECT  **SAVE**
FROM-FACTORY MIDDLEMAN
PROFITS

**MASTER MECHANIC PORTABLE LIGHT PLANTS
PUSH BUTTON START**



AC Plant 600-700 Watts — 115 v. 60 cyc.
Powered by a rugged 2 hp. easy starting Briggs
gas engine. No wiring necessary; just plug in
and operate. Plenty of current for receivers,
transmitters, antenna motors, emergency lights,
etc., which require up to 700 Watts. Ideal for
radio amateurs, Civil Defense, trailers and
camps. Complete with Voltmeter and built-in
winding to charge 6 v. auto batteries.
(Item 24)
Item 24, Wt. 75 lbs. Be prepared if war or storms
knock out power lines. **\$143.50**
700-800 Watt Plant (Item 44) same as above but
with larger engine & greater capacity **\$169.95**
1000-1200 Watt Plant (Item 45) same as Item 24 but
with larger generator and engine — 50% greater output **\$199.50**

We make all sizes up to 25,000 Watts. Write for information.

Send 10¢ for big 1965 Catalog. Free with order.

Prices f.o.b. factory. Money back guarantee. Send check or M.O.

Master Mechanic Mfg. Co., Dept. 33-J, Burlington, Wis.

(Continued from page 148)

Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., Postbox 1203, St. Gallen
Syria: P.O. Box 35, Damascus
Trieste: P.O. Box 301, Trieste, F.T.T.
Trinidad: John A. Hoford, VP4TT, P.O. Box 554, Port-of-
Spain
Tripolitania: 5A2TZ, Box 372, Tripoli
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Yugoslavia: S.R.J., Postbox 48, Belgrade

How's DX?

(Continued from page 66)

CM1RU, EA6AX, FA8IH, HC1FG, KL7e, ARZ, AYM,
BEZ, LU5DHD, OA5N, TL 2RKL, 2WLC, 5CAP, 5RM,
8FG, VK9RM, YN1MX, YV5BD and ZL2BE.

Eighty c.w. provided DU7SV (25), JA1CR (24) and
KG6GX (25) for W7JLU. K2BZT picked up many
Europeans, EL2X (5) 0-1 EST, KV4AA twice, LU1ZS (13)
0 and YV1AD (12) 19-20. 80-meter doings at random
points — W2ESO: heard ZD2DCP (7) 22-23 EST,
worked VKs 2QL, 3AHH, VP4LZ, W4CEN: nailed that
ZD2. W9APY/5: an LU "Z" feller, PY6AK. VP8BE
was W4BRB's 113th 3.5-Mc. DXCC-style country;
VE1ZZ also passed the 80-meter century mark.

Fifteen 'phone rode the erratic m.u.f. crest in such fine
style that 21-Mc. converts popped up by the dozens. A
4-hour-and-20-minute WAC is included in this W4DOU
roster: CN6MM 14 EST, a DL1 and G5, VP3YG 14, a W7,
ZC4JA 11-12, ZL2LV 16 and 4X4BL 10-11, all on 'phone.
Ross also caught ELs 10A 12A, VQs 2PL 4EZ and ZE2JE.
Heard to be active on 21-Mc. A3 by W4DOU but still
nought are FB8BC, FQ8AT, FR7ZA, VK9BS, VQs 5EK
6LQ 8CB, V5IFE, YI5AM, ZB4 1AUV 2A, ZCs 4AD 7BB,
ZD9s AB AC (100) and 4S7YL. W9RBI's first
tangle with 15 meters netted CR6BH, a ZL and 4X4BL.
LU8DB collided with EA8AC and SV8WO.
CP5AB, CX5AF, VP2KB, VQ4RF, YN1AA, YS1RA and
ZP5AM gave in to W4UWC. W6ZZ's 21-Mc. log
reveals CE2HJ, HC1LW, KV4BD, PJ2AO, TE2BX, VKs
and ZLs galore, VP6WR, ZS6DW and enough maritime
mobiles to elch him MM-diploma No. 79. CE4BP
(242), CN6s CS CX, EL3A, OK1KTL, VP5SC, VQ2DT
and ZS9G (310) are recommended by NNRC.

So there you are. The bands are jumpin' — pick your
megacycle, throw the switch, and let the prefixes fall where
they may!

HAMFEST CALENDAR

NEW YORK — The Yonkers Amateur Radio Club will hold
its 5th annual Hamfest-Dinner on Friday, December 3rd,
7 p.m., at Schmidt's Farm Restaurant, Fort Hill Road
(west of Central Park Ave.), Greenburgh, N. Y. The Din-
ner will be a choice of turkey or swordfish steak. There will
be a good time in store for all, with flowers for the YLs and
XYLs. A dance will also be held. Tickets are \$4.50 each
and may be ordered in advance from the club treasurer,
Kern Bowyer, W2GHH, 1 Midland Gardens, Bronxville
8, N. Y. Make checks payable to Kern Bowyer. No tickets
will be sold at the door.

MEMBERSHIP CHANGES OF ADDRESS

Four weeks' notice is required to effect
change of address. When notifying, please
give old as well as new address. Advise
promptly so that you will receive every
issue of QST without interruption.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.

(3) The Ham-Ad is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ -- Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS, Radio publications. Latest Call Books, \$1.50. Mrs. Earl Mead, Huntley, Montana.

WANTED: Cash or trade, fixed frequently receivers 28/42 Mc. W5YLY, Troy, Ill.

WANTED: All types of aircraft radio, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif. 96101.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

POSTCARD brings you free information on our new Amateur Desk Signs and money-saving club purchase plan. Hawkins Distributing Co., Paquetuck Terr., East Moriches, N. Y.

URGENTLY need AN/APR-4 items. New high prices. Littell, Far Hills Branch, Box 26, Dayton 9, Ohio.

RK-4D32, brand new, \$17.50 postpaid. W5AXI.

HOTTEST Ham List in the nation! Trade-ins and closeness of all leading Amateur bands including Collins, National, Johnson, Hallcrafters, Gonset, Elmac, Morrow, Harvey-Wells, RME, Millen, Meigener, Sonar. We trade and offer our own time payments tailor-made for you. All leading brands of new equipment in stock. Write for latest bulletin. Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 41, Watertown, South Dakota.

NEED ARC-II Bill O'Connell, 4908 Hampden Lane, Bethesda, Maryland.

WANTED: BC-348 receiver. W. Richards, 4908 Hampden Lane, Bethesda, Md.

NEED: ART-13, R. Ritter, 4908 Hampden Lane, Bethesda, Maryland.

TRANSFORMERS while they last! 550VCT @ 90 mile with 6.3VCT @ 3 1/2 A, cased, \$2.00 each; 700VCT @ 90 mile with 6.3VCT @ 3 1/2 A, cased, \$2.00 each; 520VCT @ 1/2 amp, IC3, \$40.00 each. Grand Transformers, Inc., 226 Washington St., Grand Haven, Michigan.

WANTED: March, May, June 1916 QST. Sell four or more QSTs 1930 to date, 25¢ each. W6MCK, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

TELESCOPIC Aluminum tubing. All sizes: 3/8" x .058 wall, 12¢ per ft.; 1/2" x .058 wall, 14 1/2¢ per ft.; 5/8" x .058 wall, 22¢ per ft. All sizes stocked. Handy Tool, Inc., P. O. 142, Tilton, N. H.

WANTED: Cash paid for BC-610 mixers and BC-221 frequency meters. In addition we buy technical manuals. Also TCS sets, R5A# ARN-7, ART-13, D.V.Y., others. Amber Company, 393 Greenwich St., New York 13, N. Y.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, \$1.50; General, \$1.75; Amateur Extra, \$2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

MICHIGAN HAMSI Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. No. 8-8696, No. 8-8262.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in bulky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

QSLs, SWLs! Finest and largest variety of samples 25¢ (refunded). "Rush" Sakers, W8DED, P.O. Box 218, Holland, Mich. (Subscriptions, renewals accepted, appreciated all radio magazines).

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

QSL's-SWL's Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

QSLs-SWLs, 100, \$2.85 and up. Samples 10¢. Griffith, W1FSW, 1042 Pine Heights Ave., Baltimore, Md.

DELUXE QSLs, Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL-SWLs, Samples, free. Bartinoski, Houlton, Me.

QSLs, Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLs! Two colors, \$2.00 hundred. Samples for stamp, Ronsdale Press, Box 164, Asher Station, Little Rock, Ark.

QSLs "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLs! Taprint, Union, Mississippi.

QSLs, Samples, 10¢. Fritz, 1213 Briargate, Joliet, Illinois.

QSLs: Beautiful blue, silver and gold on white glossy stock: \$1.85 per 100. Two-day delivery. Satisfaction guaranteed. Rush order and get surprise of your life. The Constantine Press, Bladensburg, Md.

QSL-SWL cards, Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples. QSL Press, Box 71, Passaic, N. J.

QSL samples, Dime, refunded. Roy Gale, W1BD, Watford, Conn.

QSLs, Postcard brings samples. Fred Leyden, WINZJ, 454 Proctor Ave., Revere 31, Mass.

QSLs Personalized, 150, \$2.00. Samples, 10¢. Bob Garra, Lehigh, Penna.

QSLs-SWLs, as low as \$1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLs-SWLs, Free samples. The Backus Press, C. Backus, 5318 Walker Ave., Richmond, Va.

QSLs, sample dime. Printer, Corwith, Iowa.

WESTERN Hams, order your QSLs in the west. Save time, save money. Personal Printers, P.O. Box 6453, Los Angeles 64, Calif.

QSLs, Postcard brings samples. Fred Leyden, WINZJ, 454 Proctor Ave., Revere 31, Mass.

QSLs-SWLs, Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLs! Advanced designs! Reasonably priced! Samples 10¢. Tooker Press, Lakehurst, N. J.

QSLs: New designs. Samples. Besenaris, W3QCC, 207 S. Balliet St., Frackville, Pa.

QSLs! Only the very best! Oscar Craig, P.O. Box 157, Newark, Arkansas.

W0HTN, Riesland, prints QSLs. \$1.00 for 100.

CANADIAN QSLs, Snappy samples for stamp. Beynon, VE3WV, Collingwood, Ont. Can.

QSLs! Want 'em fast? Reasonably priced? Cleanly printed? "Super-speed" Samples are the answer. Ecken samples, 10¢. Robinson, W9AVH, Dept. U, 12811 Sacramento, Blue Island, Ill.

QSLs-SWLs, Rainbows, Cartoons, Others, Reasonable, Samples 10¢ (refunded). Joe Harma, W2JME, 225 Maple, North Plainfield, N. J.

QSLs distinctively different. Postpaid. Samples free. Roland J. Dauphine, W1KMP/6, Box 78374, Los Angeles 16, Calif.

UNUSUAL Vivacolor! Illustrated QSLs, typolithographed. Free samples. WAT, Box 11, Brecksville, Ohio.

COMMUNICATIONS Engineers and Technicians! Excellent salaries, minimum requirements. Engineer: Graduate with 3 years experience. Technician: 2 years school in communications and 5 years experience. Require installation, adjustment, and maintenance experience with communication receivers and associated terminal equipment. Also, men with similar experience with high-powered transmitters, antennas, transmission lines. Must be willing to travel in United States and overseas. Write: Page Communications Engineers, Inc., 710 Fourteenth St., N.W., Washington 5, D. C.

FOR Sale: Practically new RCA tape recorder, less than 30 days old, two speed, 1800 ft. plastic tape, \$15.00. W9LQ1, Boyd, Ashton, Ill.

SURPLUS: RG-8/U cable 100 ft. \$5.95, 250 ft., \$13.25; 500 ft. \$25.00. New connectors, PL-259 and SO-219, 5 for \$2.00; new oil-filled condensers, 600 WVDC, 2 mfd., 69¢, 4 mfd., 90¢, 7 mfd., 95¢, dual 8 mfd., \$1.95, 1000 WVDC, 1 mfd., 69¢, 2 mfd., 90¢, 4 mfd., \$1.59, 5 mfd., \$1.25. AN/AP-13 1420 MC transceiver with 17 tubes, \$15.50. Postage extra. Request new bargain bulletin. Visit new store for thousands of underpriced bargains. Wanted to purchase: Surplus radio equipment, Navy synchro, Electronic Research Laboratories, 715-19 Arch St., Philadelphia 6, Penna.

COLLECTING War Dept. Technical Manuals, etc., in communications and electronics. What have you got? Write to: Bob Brodly, 140 West 57th St. (1 RE), New York 19, N. Y.

GLOBE KING, 400 watts. Like new, factory shielded, coils for 80, 40, 20 crystal mix and some extra tubes. Best offer over \$350.00. Clem Coggins, 232 Rose St., Jackson, Miss.

WANTED: RME VHF2-II. State condition and price. W1EJ, 501 Perkiomen, Lanafale, Penna.

FOR Sale or swap: Collins ART-13, Autotune, in gnd condx and operational, complete with low frequency, exciter, crystal calibrator, speech amplifier, and instruction manual. Want: J2V2 or similar transmitter, W5VJR, 3404 South Atlanta Pl., Tulsa, Okla.

FOR Sale: National HRO-50-T with coils A,B,C, and D, plus speaker, like new, best offer, Pietro Bomben, 1647 Langlois Ave., Windsor, Ontario, Canada.

SHOPPING Early? Jumbo lawn stake callign, reflectorized aluminum, \$2.75, mobile sign, Regular, \$1.50, Jumbo, \$2.00. Overnight delivery. Whitley, W2LPG, 133 Airside Ave., Long Branch, N. J.

NATIONAL NC-57 rcvr, gnd condx, new tubes, \$50.00. L. Blum, 47 N. Westgate Columbus 4, Ohio.

SELL: National HRO50-T rcvr, complete: coils, tubes, speaker, power supply, VHF152A, never used, 15B22A, six months old, perfect condx. W2JHL, Box 62, Brooklyn 12, N. Y.

COLLINS 32V3, new condition, in original carton, \$600. 75A3, new, unused, with 800 and 3 Kc. mech. filter, xtal, coils, and speaker. Complete. \$500.00. P.O.B. Chicago, Ill. Richard Karl, 2856 Leland Ave., Chicago, Ill.

MISCELLANEOUS gear for sale. Call or write for list. Some free to local Novices or hams. Ross, Apt. 321, 1107 W. Green, Urbana, Ill. Tel. 7-3393.

SELL: 75A1, NFM and matching speaker, \$485.00. SX71, \$165.00; Eldico GDO, \$20.00; 28 Mc. xmitter with 6VDC dynamotor and relays, \$30.00. Shover, W8ZBD, 511 N. Warner, Bay City, Mich.

TBS-5C, TVFid, Viking VFO, power supplies, in excellent cond., deliver within 100 mi. Ex-W2VBP/4, 211 Longwood Court, Huntsville, Alabama.

SELL: 300 w. rig; 80-10 m, 812-Aa, final, 811-Aa mod; 28" rack with power supplies, \$250.00. J. C. Mitchell, W2BHS, 195 Amherstdale Road, Snyder 21, N. Y.

WANTED: Collins KW-1. State condition and price. Uncle Dave, W2APF, Ft. Orange Radio Distributing Co., Inc., 904 Broadway, Albany, N. Y.

VIKING II and Viking VFO, factory wired, TVFid, like new, \$210.00 takes both of them. N.Y.C. area. Pioneer 2-2091.

S-76 with R-46A, \$150.00; Triplett 3256 wavemeter, \$10.00; Eldico line filter, \$5.00; Shure 508C mike, \$10.00; Heath GDO, \$12.00; Heath Antenna meter, \$10.00; Sonar low pass filter, \$7.50; Master All-band antenna with 40 and 80 coils, \$5.00; McIntosh A-116 amplifier, \$100.00; 6V-300V, 150 Ma. dynamotor, \$5.00. Fred S. Eggert, 11833 Wisconsin, Detroit 4, Mich.

TRADE TBS-50D for SX-25 or NC-57B or S-36A. W4ENQ.

COLLINS 30K-1, complete, in new condition, \$900. Motorola model FMT 30 DMS, 30 meter, \$275.00. 40 Mc. FMT 75 DMS, 75 mtr. WITHM, A. J. Brizzolari.

SALE: 170 watt c.w. xmitter, 6L6-813 power supplies included. Best offer over \$100.00. Lanny Poole, 3441 Cliff Rd., Birmingham, Alabama.

BC-342 receiver, unconverted, \$65.00; RME 10-20 converter, \$45.00; VTVM, Electronic design Model 100, \$20.00; 30 KV probe, \$45.00; Philco 7170 AM/FM signal generator, \$35.00; 500 watt final, rack, all bands with 812-H; B&W band switching grid turret, two meters, \$50.00; complete power supply, rack, 500 VDC, 300 Ma., \$35.00; Dynamotors 250 VDC and 350 VDC, both 6 VDC inp., new; any good offer, all inquiries answered, W2PDH, Clark, 44 Lewis Lane, Syosset, L. I., N. Y.

FOR Sale: Office typewriter, mimeograph. Bargain priced. Local deal preferred. Samofsky, 527 Bedford Avenue, Brooklyn, N. Y.

WANTED: A UHF Resonator 1-clement or Telrex 5-clement 20-meter beam. Also, a 66 ft. whip. John Wilson, W8ZWV, Lawyer at Club, Ann Arbor, Michigan.

WANTED: Hammarlund Super Pro or other gud rcvcr, perfect condx from New York ham. Call Ray Furr, P1-7628, 349 East 49th St., New York 17, N. Y.

COMPLETE Mobile and home station: HQ-129X and apkr, very good condx; Elmac 154H xmitter, used very little, extra cabinet for Elmac; A.C. supply for Elmac; two 450 volt 200 Ma. compact 6 or 12 volt Vibrators, push-to-talk Electro-Voice dynamo mike; complete WIGH slug-tuned mobile ant. and extra, cost \$40. Really works. Master Mobile body mount and coax cables; Dow-Key 6 volt coax relay and cables. Precision 954 analyzer and tube tester. Let's hear your offers fellows. W3PFD, 357 13th Ave., New Brighton, Pa.

FOR Sale: NC183 with speaker, like new, \$175.00; excellent 2-meter xtal converter with power supply, tubes, xtal, 6-10 Mc. IF, \$20.00; Johnson 150DD70 condenser, \$8.00; Johnson ceramic rotary inductor capable KW, \$10.00; complete 2-meter portable, mobile, fixed station, receiver, xmitter and power supply 110 VAC or 6VDC, in oak case, \$65.00; 10-meter, Handie-talkie with tubes, xtal and batteries, QST Feb. 10, \$25.00; 807s, 500; 2B26, \$1.50; 100TH, \$4.00; homemade Panadaptor and power supply, \$20.00. W. J. Moulton, Rt. 5, Chippewa Falls, Wisconsin. Phone 300.

DANGER! High Voltage! Metal signs, 3" x 12", baked enamel coils, \$1.00 postpaid. Save! 3-color reflectorized aluminum call-signs, 2" x 3", \$10.00 postpaid, 4" x 12", \$1.50 postpaid. R. Lackner, W9WFT, 2029 Bradley, Chicago 18, Ill.

WILL Swap or sell: BC221-J, \$65; VHF152A, \$55; Millen VHF xmitter, Model 90810 with coils, Tubes, crystals, \$65.00; Millen 750v. power supply Model 90810, \$50. Electro-Voice speech clipper, Model 1000, \$10.00; Mettner signal shifter, \$50.00. Will consider swap in involving modulation xformer of 500 w. or better. All prices F.O.B. Endicott, N. Y. K2BHP, Box 113, Endicott, N. Y.

SELL: Elmac AS4, Carter dynamotor, Triband converter, noise limiter, loading coil and Hi-hat, complete, \$160.00. \$425A, \$10.00 each, new MB150, \$15.00, 1 KW modulator and speech amplifier, \$15.00. BC458, converted for SSB with filament transformer, \$12.00; BC453 Q5-r with power supply, \$15.00. W1SUQ.

FOR Sale: 2 BC-611F Handie-Talkies, in excellent condition. W4MFV, Robert J. Moore, 402 Edgewood Avenue, Rome, Georgia.

SCR-522 transmitter with 110V power supply, modified 2 meters; Gonset 2-meter converter and noise silencer; P101 dynamotor complete; all excellent, \$90.00. John J. Dupre, KBDD, 872 Warfield Ave., Oakland, Calif.

SELL: Complete station: VFO, Allband, AM-CW kilowatt transmitter, NC173 receiver and bux, need cash for college. KW xmitter recently built; 6AB6, 6AG7, 6L6, 807, P8B1s, complete with all tubes, per supplies, relays, meters, coils (KW are plug-in), and in rack cabinet, complete, send for free pictures and schematic. Receiver in excellent condition. Realigned 1 year ago. Also Champion bux. Need money for college. Price: \$500. Might consider individual sale (xmitter in Chicago). W9QXR/P.O. Box 1855, College of St. Thomas, St. Paul, Minn.

FOR Sale: Gonset Super Six converter, \$50.00; Gonset Tri-Band covers 10-20-75, \$35.00. Both as new. VESAY, P.O. 128, Lancer, Sask., Can.

SELL: HRO60 coils A to F, calibrator, new condx, \$450.00. R. Ridenour, 839 Wildwood Pkwy, Balto 29, Md.

QSTs: 1946-1953, \$15.00 plus postage. W8BBS.

SALE: Apr. 1924 to Dec. 1951 incl. QSTs. Trade Leica 3-B lenses, etc. for good receiver. Howard C. Melcher, W3EFT, 2174 E. Cumberland St., Phila. 23, Pa.

BOEHME Automatic tape transmitter, complete with accurate Speedometer, plus McElroy tape perforator, all AC operation, suitable for school or commercial, \$145.00. Frank Borodoy, W2AYN/4, 1413 North Barton St., Arlington, Va.

WANTED for cash: Viking I or II. Not in operating condition. K2CW, 69 Ashland Road, Summit, N. J.

32V2 perfection condition, \$420. K6GZH, 1138 W. 8th St., Santa Ana, Calif.

WANTED: Tilt base for SX 42 rcvr. Harry Purcell, 1143 "D", Harvard, Santa Monica, Calif.

SX-24 and speaker. Sell \$50, or trade with cash for 40-80 mobile transmitter and receiver. Consider enclosed AM transmitter. All letters will be answered. Donovan O'Brien, W9FKR, 8 s Hammond Aurora, Ill.

FREE gift, new Astatic D-104 microphone with each purchase of Elmac AF-67, or Gonset Communicator. Your choice of either Vest Pocket Beam, Shortbeam, or Bantam Beam with each new Halli-crater SX-96 receiver, Beam and microphone with each new SX-88. Tell us what you want. We'll make you a real deal! National Hi-Fi components. Many terrific bargains! Telco, Azurite Dome, Malibu, Calif. Tel: GLOBE 6-2611. Write, wire or phone anytime!

TRADE ABBOTT TR4B 2-meter transceiver for VOM. Tannenbaum, 1515 East 8th St., Brooklyn, N. Y.

FOR Sale: Elmac A-54-H. Excellent condition with AC supply, built to manufacturer's specifications. Both \$115.00. Electro-Voice mike with stand, Model 60, \$12.50. Simpson Model 240 multimeter, new, \$20.00. James W. Craig, Jr., 3413 W. Roosevelt Dr., Lake Charles, La.

FOR Sale: 1 reconditioned National Select-O-Ject S-O-J 3. Send a money order for \$20.00 and your address. Write to Cecil Moore, Madisonville, Texas.

80-40 Mc. Am crystal controlled 10-tube receiver, 6 volts DC with tube. Elmac. Electronic Supply, 37-10 33 St., L. I. C., N. Y.

WANTED: ART-13 transmitter. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.

VIKING II factory-wired, with Matchbox, used 20 hours, \$250.00; BC459, new, \$15.00; cascade converter for 144 Mc., \$30.00. No time to use. Wm. Baxendale, 2026 Kimball, Brooklyn, N. Y.

SELL: Halli-crater SX-43 and R-44 matching speaker, \$130.00. F.O.B. Weno Kosecky, 1502 K St., S.W., Cedar Rapids, Iowa.

FOR Sale: HRO-60 coils and speaker, like new, \$350.00. Viking II factory wired, like new, \$250.00. Viking VFO, factory wired, \$40.00; 1-el. 10 & 20 beam, rotor, indicator made by Johnson, relays, 48 feet aluminum tower, complete, \$175.00. Estate of K6ARG, Mrs. J. W. Smith, 469 Dawson Ave., Long Beach 14, Calif.

FOR Sale: P-P 4-65A final, 500 watt input, completely metered, flower-cooled, shielded and filtered for TVI, \$100. Lyco Transmaster, PB exciter for above, \$50.00. Make an offer or trade. Joe Welch, W8PXC, 5026 59th Ave., Hyattsville P.O., Md.

WANTED: Book "Two Hundred Meters and Down." State price. W8HSG.

COLLINS 75A1 with speaker, \$200; Eldico TR75TV xmitter, \$40.00. Will not ship. B. Einwich, KN2HCA, 146 Union Ave., Rutherford, N. J.

HARVEY-WELLS TBS-50-D with VFO and APS-30. Used about 100 hours. Excellent appearance. \$140 cash pickup. Roberts, 126 Ashbrook St., Springfield, Mass.

FOR Sale: TBS50C, new AC power supply. Both in excellent condx. \$90.00. C. B. Story, WTTGZ, 340 Wyoming Ave., Sheridan, Wyoming.

WANTED: Collins 30K-1 or KW1 for cash. W2BBV, 49 Frum Ave., Yonkers, N. Y.

TOP Dollar paid for ART-13s, dynamotors, parts, racks and all other component parts. Write to Harjo Sales Co., 4109 Burbank Boulevard, Burbank, Calif.

Be Admired. Be recognized. Your call-letters on a beautifully finished Rhodium tie-bar, \$2.00. Val's, 22 Brookshire Road, Hyannis, Mass.

SELL: Bendix automatic band-switching transmitter 100 watt, fone/cw 540 to 9050 Kc.; new BC459 and companion receiver with dual power supply. W8ET, 366 Canterbury Road, Bay Village, Ohio.

SELL: Hammarlund Pro 400X, complete. Guaranteed, like new. Spotless, \$275.00. R. Long, 933 E. Broadway, So. Boston, Mass.

FOR Sale: Harvey-Wells TBS-50 with APS-50 power supply, \$80.00. J. E. Taylor, Stanwood Road, Mt. Kisco, N. Y.

GONSET Communicator converted to new power supply for 12 volt ignition. New 12/115 volt Communicator with warranty, \$219.50 or your Gonset converted, \$24.50. Pacific Engineering Co., 839 N. June St., Los Angeles 38, Calif.

VIKING II with V.R.O. in new condition, \$275.00. HRO 50TI with speaker and 80-40-20-10 coils, \$275.00. W9V9F, Gutzmer, 903 S. Madison St., Hinsdale, Ill.

EXCHANGE: 200 watt all band fone/cw. xmitter. 813 final, Bud steel cabinet, fully power supplied. Needs some work. Also all parts for 300 watt power supply. Miscellaneous transformers, condensers, coils, RME Preselector, Abbott TR4, Mallory Vibrapak. For Hi-Fi equipment of equal value, or \$195.00. Cash. Prefer buyer radius 150 miles. W1MAE, Bradford, R. I.

WANTED: 250-300 watt c.w. only xmitter, 80-40-20, with power supply; all details first letter. K2EOZ, 48 Walnut St., Auburn, N. Y.

SELL or swap: 150 watt c.w. xmitter per supply, also SW-54. G. Weriau, Todd Road, Katonah, N. Y.

FOR Sale: 1 base station transmitter, 2 car transmitters and a number of different types of receivers for base station and cars. The transmitters are set at 24.58 Kcs. For information on these please write or contact Mr. Grover C. Harrison, Police Commissioner, Electra, Texas.

WANTED: Complete 2-meter rig. B. J. Parisi, Box 1005, Onset, Mass.

SELL: National NC-101X rcvr. Gud condx, best offer: 6146 cw xmitter, 90 w. with power supply, \$65.00; 380 v., 6.3v.-5.0 V power supply \$12.00; Triplett frequency meter, \$10.00. Need money for college. W2IIG/4, Georgia Tech, Box 1573, Atlanta, Ga.

SELL: S-40B receiver, in excellent condition, with "S" meter, \$90.00. Alan Steger, Box 807, Huntington Station, N. Y.

SELL: Parallel 807s, 80-10 meters. TVI proof. 75 watts with built-in regulated power supply, 1954 ARRL Handbook design. Prefer local sale. Complete, \$75.00. W1WXC, 24 Monument St., Concord, Mass.

WANTED: One Heathkit ATL transmitter. S. Booth, 1236 Roosevelt Ct., Apt. 1, St. Paul 13, Minn.

REQUEST the following back issues of QST: 1952, October, November and December; 1953, January, February, May and June. Claude M. Phillips, 152 New Laredo Highway, San Antonio, Texas.

HRO-60 table model, atal calibrator, coil, perfect, \$475.00; BC-610 mtr, Millen ECD, excellent, \$425.00. W7BDW, 10910 Algonquin Road, Edmonds, Washington.

3 tube 6-cil Meisner receiver. Best offer. Roger Frech, 3107 Maryland Road, Rockford, Ill.

FOR Sale: HRO50T1, apr. A, AA, AC, B, C, D, E, and F coils, NBPM adaptor, 100/1000 atal calib. \$325.00. Viking II, Viking VFO, \$295.00, all in excellent condx. Bill Speck, 108 Washington, Marietta, Ga.

SELL: New LW 2-meter, crystal controlled converter, \$12.00. New cathode modulator kit, \$10. New VFO kit. Power supply, \$20. Regulated power supply, \$10. More info on request. W0GCV, 798 Sherrburne, St. Paul, Minn.

WANTED: Viking II or similar transmitter, VFO bug, and Match-box. State price. Will sell Harvey-Wells, Sr. with power supply and S8C, AR-Z. Bill Crowell, W3ZJG, 330 Paxtang Ave., Harrisburg, Penna.

HAVE Surplus Vibrapacks, clean and fully guaranteed. 6VDC input 400VDC 100MA, output size 1/2" x 3/4" x 6", about 6 lbs complete, \$12.50. Crystals FT, 243 base 8150 KC, \$95. 6L6's metal, \$70. 6C5's metal, \$65. Speed-X straight keys, \$60. 001 5000VDC surplus, \$80. 6VDC motors with gear assembly for sending SSS, \$55.00. 11 PSI antenna switch, tap switch, \$1.05. Gallagher's Service, W2VAP, Boiceville, N. Y.

FOR Sale: HQ129X with matching speaker, clean condition. Best offer express collect. Dave Beckwith, W2SHC, Pompton Lakes, N. J.

BARGAINS! with new guarantee: R-9'er, \$14.95; Gonset Triband, \$27.50; VHF 152A, \$39.50; S-72, \$59.50; S-40, \$65.00; NC-37, \$65.00; RME45, \$99.00; S-72, \$69.00; S-42, \$69.00; SX-43, \$129.00; S-76, \$149.00; HT-17, \$169.00; SX-127, \$189.00; HRO-50, \$275.00; HT-17, \$32.50; EX Shifter, \$39.00; Globe Trotter, \$49.50; Harvey Wells, \$69.00; HRO-60, \$299.00; HRO-50, \$299.00; S-75, \$189.00; HT-9, \$159.00; Globe King, \$275.00; 32V1, \$195.00; 32V2, \$475.00; 32V3, \$595.00. We need used receivers: We give highest allowances for S-20R; SX-71, NC-100, S-40B, NC-125, SX-24, SX-25, HQ-129X and similar receivers. Free trial. Terms financed by Leo, W0GCV. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SOLA constant voltage transformer, pr. volts 95-190 to 125-250, rated VA 2000, frequency 60-60 Hz. Will trade for a good receiver or transmitter. Lloyd L. Kimmel, Box 337, Cookeville, Tennessee.

WANTED: Used amateur and gov't surplus equipment in trade for new Johnson Viking, Ranger, Harvey Wells, National, Hammarlund, Hallicrafters, Barker & Williamson, Telco, Gonset, Elmac, Morrow, etc. Particularly want complete or parts for ART-13, Dy-17, CU-25, Dy-12, BC-348, BC-342, BC-312, BC-221, LM, APR-A tuning units, APR-5, ARC-1, ARC-3, RTA-1B, BC-610, BC-614, BC-939, TCS, TDQ, Collins 75A, 32V, 310, Tele. Tape recorders, Boemhe, Technical manuals, Loran, Radar, cash or trade. Write to Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048. (Stores: 44 Canal St., Boston, Mass., 60 Spring St., Newport, R. I.)

REAL bargains: New and reconditioned Collins, National, Hallicrafters, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Lyco, others. Reconditioned S-38, \$29.00; S-40A, \$69.00; S-76, \$129.00; NC-37, \$59.00; NC-88, \$79.00; NC-125, \$129.00; NC-183, \$199.00; HRO-30T1, \$199.00; HRO-60, \$199.00; HQ-129X, \$169.00; VHF-152A, \$49.00; RME45, \$99.00; Gonset Tri-band, \$79.00; Super-Ceiver, \$79.00; S-40B, SX-71, SX-28A, SX-42, SX-62, HFS, HRO-5, HRO-6, Collins 75A1, 75-2, 32-2, 32V, 310, 312, 314, Harvey-Wells Bandmaster transmitters, others. Shipped on Butler II. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler II, Missouri.

HARVEY UHX-10 and/or cabinet wanted. W1BB.

GLOBE KING 400-C hardly used. \$450 for 80 meters. Bud VFO with all coils. Best antenna tuner. Antenna changeover relay. All equipment in excellent condition. Coino for cash. Jack Knudson, W0NKD, Box 561, Granby, Colorado.

ATTENTION Hama NYC-LI vicinity! Selling HQ-129X, Viking I with VFO & B & W 72 ohm trap, in excellent condition. Best offer cash and carry. W2SJM.

WANTED - Mobile rig complete with antenna system and plate supply. Must be in good condition and reasonable in price. Ross Burgess, W6MDH, McCluskey, North Dakota.

MUST sell complete station. Consists B&W 5100 and National HRO-50T1. Transmitter better with less than five hours operation. Receiver in excellent condition and complete with matching speaker. National XCU-50-2 crystal calibrator and ABCD coils. Will ship freight prepaid anywhere statewide in original factory cartons. Want \$295 for transmitter and \$275 for receiver. Will sell both and include 22X mike, 50' RGR-U and 110 volt coax relay for \$600. W0AQJ, 6704, No. 31st Ave., Omaha 11, Neb.

VIKING 2 - V.F.O. - and Match-box, \$325.00, purchased in June. Will sell individually. W3CJP, 125 Girard Ave., Hyde Park, Reading, Pa.

IMAGE orthicons and iconoscopes removed from broadcast service but good for amateur TV use, \$35 each FOB. WCOS-TV, Columbia, S. C.

COLLINS 310B-1, \$180.00; Hallicrafters Sky Champion S20-R, \$35.00; Meisner manual shifter, \$25.00; Gonset 1000, 8 condenser indicator, \$10.00; Heathkit transmitter, coupler, VFO kits unwired, \$57.50; Underwood typewriter, \$30.00; Mallory CRT-1 condenser checker, \$25.00; CO-2A, 6146 six meter final, \$11.50; RME VHF-152 (needs repair), \$25.00; NCTIC, above offered prepaid U. S. A. Cryalax, meters, transmitting tubes, complete parts 300 to 1000 volt supplies, command transmitters several frequencies, miscellaneous units, real bargains, everything guaranteed, request complete detailed lists. WANTED: Dixieland jazz tapes, records, transcriptions. Will rent, swap radio parts or loan my collection Dixieland tapes. W0DPL, Howard Severed, 241 East Riverside Drive, Indianapolis, Ind.

V17 pushed 32V1, B&W low pass, co-ax relay, antenna coupler, D-104, push to talk, connectors, \$400; SX-28A, matching speaker, \$160; HF-10-20, \$35; SP-44 panadapter, \$60; Tem meter Elincor beam, rotator, relay, \$50. Colorado sales preferred. Estate W0FHM. Mrs. Anna Palm, 1648 Ninth St., Boulder, Colo. Phone H1-3-0643.

SELL: Collins 75A-2A with 3 kc, 6 kc filters, speaker, \$445. 32V-1, 32V-2, 32V-3, \$595. 21A teletype midgate tape printer, \$499. 440 meter, \$25. 12,000 ohm droid 110 vdc relays, \$175; Collins 30-J with 310C, \$425; Boehme perforated tape keyer for Morse code with McElroy 3-key perforator, \$145; HRO-31A1 with coils, speaker and power supply, \$165; NC-88, \$75. Will take ham or surplus equipment in trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

FOR Sale. BC 610E and BC 614E Speech amplifier Tuning units 2 mc through 30 mc. Condition like new. Complete with manual, cables, remote control. \$500.00. Tel. Bria, 5573 No. Van Ness Blvd., Fresno, Calif.

COLLINS 32V1, Excellent, \$600. Don DeShazo, Jr., W9BVC, 529 Blackstone, LaGrange, Illinois.

RKY MTN headqtrs for SSB. Central kits or wired in stock. Real bargains: New or reconditioned Elmac, Gonset, Morrow, Collins, Johnson, Hammarlund, National, Hallicrafters, RME, others. Reconditioned S40A, \$60; S40B, \$69; S76, \$125; NC125, \$130; NC181, \$190; RME45, \$90; S31A, NC33, SX24, 02 Heathcote, 2T Panadapter, Bandmaster Sr. Super-ciever, ST203A, Subradio MT15X, 1B22A, RM609, HT-9, We trade. Easy terms. Write Mel, W0GCV, Rogers Radio Co., 1745 Arapahoe St., Denver, Colo.

WANTED - One 1946 Edition of the Radio Amateur's Handbook in good condition. Will pay \$1.25. Don Boughton, 1259 Pacific Beach, San Diego, California.

BUD VFO-21, \$29.95; Collins 32V1 modified, \$475.00; 32V2, \$495.00; Deltronic CD-144, \$129.95; Gonset 10-11 converter, \$24.95; 2 meter converter, \$24.95; Hallicrafters HT-9, \$100.00; HT-9, \$99.95; HT-18, \$75.00; SR-75, \$89.95; S-18, \$59.95; S-29, \$40.00; S-38, \$14.95; S-38 A/B/C, \$19.95; S-40B, \$79.95; S-51A, \$64.95; S-72, \$59.95; S-76, \$149.95; SX-62, \$250.00; Harvey Wells TBS-50A, \$79.95; TBS-50C, \$89.95; TBS-50D, \$99.95; APS-50, \$29.95; Johnson Viking I with push-to-talk and built-in VFO, \$250.00; Lyco 381, \$19.95; 381-R, \$24.95; 401, \$14.95; 500, \$69.95; 600, \$110.00; 600B, \$129.95; National HFS, \$99.95; NC-46, \$79.95; NC-181, \$299.95; SW-54, \$14.95; other used items available; free list from W1BFT, Evans Radio, Concord, N. H.

EXTREMELY effective twenty meter rotary beams. Driven elements, insulated-type of construction. Literature including actual photographs upon request. Write Apex Antenna Company, 2558 Ida St., Omaha, Nebraska.

FOR Sale: Wilcox F3 receiver, \$25; GR 726A VTVM, \$50; Federal LX1 signal generator 8-330 MC, \$150; GR LRI secondary frequency standard, \$585; GE VVZ1 Decade scaling unit, \$85; Stancor 10-11, 10-11, meter multiplier transmitter, \$15; GE-445, \$10; WE 124-B amplifier, \$95; RCA 1V oscilloscope, \$11; McElroy tape puller, \$4; WE composite set (1 telephone plus 4 telegraph/signal circuits on 2 pair wires), \$95; EE89A telephone repeater, \$9; RM29A remote control unit, \$5; WE255A relay controls, \$54; RME 521, amplifier, \$29; communication equipment 12D telephone repeater, \$19. All guaranteed excellent electrical and mechanical condition. FOB. W6ITH, Moraga, Calif.

QSTs wanted Jan. thru May 1916 and Dec. 1915. Will pay \$10 cash, each. C. W. Jans, Col. Sig. C. Pl. Monmouth, N. J.

RACKS. Open basic racks, undrilled, unpainted. Sturdy electro-welded construction. Made entirely of mild angle steel 1 1/2 x 1 1/2 x 1/8. Overall: 48 1/2" high, 20 1/2" wide, 18 1/2" deep. For 19" panels. Total vertical panel space 45 1/2". Weight 16 lbs. Price, \$8.95 F.O.B. Lansing. W8BQJ, Everet Laboratories, 235 E. Jackson St., Lansing 6, Mich.

FOR Sale: Collins receiver 75A-1 with triple conversion, \$275.00; Collins exciter 310B-1, TVI proofed, \$200.00; restricted range speech amplifier 200-2500 cycles, \$50.00; transmitter, 750 watts phone-C, PP 813 with 2E26 driver, variac control, TVI proofed, 800PS PF class B with negative peak and hi-level speech clipping, \$350.00; Graphlex camera 5 x 7, 14.5 210mm Bausch-Lomb Zeiss Tessar lens, \$99.00; final amplifier PP-125, B&W butterfly plate tank, National M 80A grid circuit, \$150.00; W8JRG, 640 Snowhill Blvd., Springfield, Ohio, Tel. 2-8722.

VIKING II, like new, VFO, matchbox, LP filter, SX-42, speaker, recently aligned, complete, P.O.B. First \$500.00 takes all. John, 2636 Fifth Ave., Sacramento, Calif.

PRINTED circuits: Here is your chance to get started with this new and superior wiring technique. Achieve compactness and neatness not possible with old wiring methods. Kit contains all materials and instructions to make two complete copper clad printed patterns. Send \$2.95 now. Felix Dutko, 2078 Vyse Ave., Bronx 60, N. Y.

EICO signal generator, model 315, \$25; manufactured VFO 40 and 80 meters, \$15; new 3 1/2" round bakelite case panel meters, \$4 each; G.E. 0-4 R.F. ammeters, G.E. 2.5 ICL kilovolts, Weston 1.5 MA DC, Westinghouse 0-150 Volts A.C. W0YV, 641 4th Avenue, San Francisco 21, Calif.

WHO'S Who in So. Dak. Hamdom. A 66-page book containing pictures and autobiographies of S. D. amateurs, highlights and side-glimpses of S. D. nets, YLRL, call letters, licenses, VHF activity, and alphabetical listings by call or by cities. Send \$2.75 to Prairie Dog Arc, Box 257, Vermillion, S. D.

SWAP: RAX-1 (200-1500 kc) rcvr. for NC-108 (FM) L. G. Barrett, 26 S. Main, Hanover, N. H.

HRO-60 Receiver for sale complete with coil sets A, B, C, D; also E and F for broadcast bands, matching speaker and crystal calibrator. Perfect condition, purchased new only 3 months ago. Complete outfit, \$500.00 F.O.B. K2BMV, Herman Ferber, 235 Spring Valley Ave., Hackensack, N. J. Phone HU-7-1726.

SELL: NC-46 receiver, 55-30 Mc. top condx, has noise limiter bandspread, etc. \$50 takes it. W. F. Haflerman, Jr., W9QJK, Box 81, Mellen, Wis.

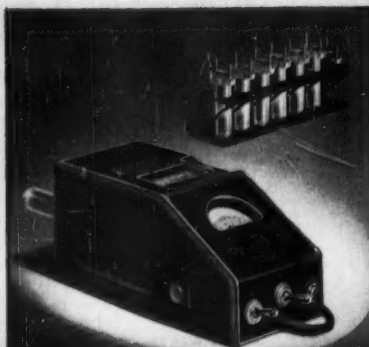
SX-71 like new, original carton and instructions, \$170; NC-57 good condition, \$60; Mallory VP553 vibrapack, \$13; 200 watt AM rig, 813 final, 811's modulators, 1200 volt 500 ma supply, 500 volt 250 ma supply, all complete or by chassis. Details on request. T. A. Zander, W0CVN, 204 N. Murray, Madison, Wis.

SELL. AM/FRC-1 350 Watts Transmitter Receiver bulletin upon request - BC-221-A - LM14 - Scott High Fidelity Receiver - Hallicrafters SX-42 W1BUU, A. van Breems, New Canaan, Conn. 32V-2 for sale, \$400.00, like new, in original packing. Recently thoroughly checked and in perfect condition. Includes B&W low pass filter. Has been used a total of about 30 hours. Reason for selling: owner overseas. Please contact Dr. Millett G. Morgan, WHIDA, Thayer School of Engineering, Hanover, N. H.

Designed for



Application



90651

The No. 90651 GRID DIP METER

The No. 90651 MILLEN GRID DIP METER is compact and completely self contained. The AC power supply is of the "transformer" type. The drum dial has seven calibrated uniform length scales from 1.5 MC to 300 MC plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc. Internal terminal strip permits battery operation for antenna measurement.

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Index of Advertisers

Allied Radio Corp.	163
American Electronics Co.	118, 134
Amperex Electronics Corp.	154
American Radio Relay League, Inc.	
OST	158
Binders	152
League Emblem	148
Single Sideband	150
Antenna Book	114
License Manual	152
Antenna Engineering Corp.	153
Arrow Electronics, Inc.	127
Ashe Radio Co., Walter	121
Barker & Williamson, Inc.	95
Belden Manufacturing Co.	109
Boulevard Electronics	148
Bud Radio, Inc.	117
Burstein-Applebee Co.	148
Candler System Co.	126
Centralab	90, 100
Central Electronics, Inc.	105
C & G Radio Supply Co.	133
Chase Manufacturing Co.	122
Collins Radio Co.	2
Crawford Radio	146
Dale Electronic Distributors	108
Dow-Key Co., Inc., The	20
Dzerama	138
DX-O-Graph	140
Eitel-McCullough, Inc.	91
Electro-Voice, Inc.	97
Electrons, Inc.	156
Engineering Associates	144
Equipment Crafters, Inc.	124
Evans Radio	140
Ft. Orange Radio Distributing Co., Inc.	98, 99
Freed Transformer Co. Inc.	155
Gardiner & Co.	132
General Electric Co.	1
Gonset Co., The	86, 87, 144
Gotham Hobby Corp.	94
Hallicrafters Co.	47
Halliday Moede Co.	157
Hammarlund Mfg. Co., Inc.	82, 83
Harrison Radio Corp.	149
Hart Industries	142
Harvey Radio Co.	111
Harvey-Wells Electronics, Inc.	101
Heath Co., The	8, 85
Henry Radio Stores	115
Hughes Res. & Dev. Labs.	125
Hy-Lite Antennae, Inc.	151
Instructograph Co.	142
International Business Machines	145
International Crystal Mfg. Co.	107
International Resistance Co.	104
Johnson Co., E. F.	89
Jones Electronic Co., Inc., M. C.	128
Lafayette Radio	143
Lakeshore Industries	155
Lampkin Laboratories, Inc.	156
Lettine Radio Mfg. Co.	122
Lewis Co., E. B.	110
Lindly & Co.	116
Lomar Products Co.	138
L. W. Electronics Lab	130
Mallory & Co., Inc., P. K.	93
Marshall Manufacturing Co.	116
Mass. Radio & Telegraph School	142
Master Mechanic Mfg. Co.	158
Master Mobile Mounts, Inc.	151
McElroy Manufacturing Corp. T. R.	102
Millen Mfg. Co., Inc., The James	162
Mosley Electronics, Inc.	123
Mul-L-Products Co.	147
National Co., Inc.	Cov. III, 80, 81
National Tuberculosis Assn.	126
Obmte Manufacturing Co.	119
Pacific Engineering Co.	140
Palco Engineering, Inc.	137
Panoramic Radio Products, Inc.	112
Peterson Radio Co., Inc.	5
Plastics Corp.	134
Port Arthur College	114
Precision Apparatus Co., Inc.	88
Radcliff's	126
Radio Corporation of America	Cov. IV
Radio Shack Corp., The	113
Radio Specialties, Inc.	135
Raytheon Manufacturing Co.	92, 142
RCA Institutes, Inc.	144
Regency (Div. of I.D.E.A.)	156
Relay Sales, Inc.	134
Rider Publishers, John F.	132
Selectronic Supplies, Inc.	116
Sonar Radio Corp.	103
Sooner Electronics Co.	140
Springer Aircraft Radio Co., Earl W.	140
Standard Piezo Co.	136
Steinberg's Inc.	106
Sun Parts Distributors, Inc.	141
S & W Electronics	110
Teleplex Co.	138
Telvac	136
Telrex, Inc.	131
Tennalab	128
Terminal Radio Corp.	139
Triad Transformer Corp.	144
Tung-Sol Electric, Inc.	132
Turner Co., The	153
United Transformer Co.	Cov. 11
Universal Service	157
Valparaiso Technical Institute	148
Vesto Co., Inc.	120
Vibroplex Co., Inc., The	118
Westinghouse Electric Corp.	141
Weston Laboratories, Inc.	130
Wheaton Res. & Devel. Co.	146
Wind Turbine Co.	124
World Radio Laboratories, Inc.	124
YMCA Trade & Tech. School of N. Y.	146

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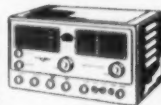


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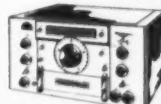


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Index to Volume XXXVIII — 1954

ANTENNAS — GENERAL

"All-Band" Antenna (H & K)	39, Dec.
Checks on 10-Meter Mobile Whips, Some (Plummer and Seidel)	34, Aug.
Compact Beam for 40 and 20 Meters, A (Turner)	17, Jan.
Compact Two-Element Beam for Twenty, A (Getter)	25, May
Electric Fence Wire for Antenna Use (H & K)	55, Nov.
High-Impedance Folded Dipoles (Engle) (Technical Correspondence)	43, Mar.
Impedance Characteristics of Harmonic Antennas (Wrigley)	10, Feb.
Lightweight 21-Mc. Three-Element Beam, A (Nose)	40, Apr.
Mobile Loop Antennas (Welster)	26, June
Novel Direction Indicator for Rotary Beams, A (H & K)	55, Nov.
Off-Center-Fed Antennas (Wrigley) (Technical Correspondence)	57, Nov.
R.F. Bridge Impedance-Matching Transformer, An (Galtner)	29, Nov.
"Simple Squirt" Beam, The (Clasen)	20, Oct.
Simple 2-Element Beam for 20 (Bauer)	24, Mar.
Stow Clamp for Mobile Antennas (H & K)	63, Jan.
Transmitter Hunting with the D.F. Loop (Norberg)	33, Apr.
Unusual 75-Meter Mobile Antenna, An (Haughton)	23, Jan.
VP (Vent Pocket) Beam, The (Hemmen and Pigg)	27, May

ANTENNAS — TRANSMISSION LINES

Coupling to Coaxial Lines (Technical Topics)	43, May
Dressing Up the Antenna Coupler (Neil)	26, Mar.
Standing Waves and TVI (Technical Topics)	44, Jan.
Tin Can Low-Pass, The (McCoy)	29, Sept.

AUDIO-FREQUENCY EQUIPMENT & DESIGN

A.M. Equivalent of Single Sideband, The (Grammer)	19, Jan.
Audio for the Mobile or Fixed-Station R.F. Assembly (Chambers)	21, Nov.
Feed-back	146, Dec.
Delay-Line Phase Shift (Griffin and Fryklund)	12, Mar.
Improved Volume-Compression Circuit, An (Brouseau)	27, Oct.
Phase-Modulation Exciter for the V.H.F. Man (Southworth)	39, Aug.
Post-Phasing Distortion (Technical Topics)	40, Feb.
Principles of Radiotelephony, Some (Goodman) — Part I	37, May
Part II	13, June
Part III	34, July
Part IV	22, Oct.
Addendum	40, June
Radical Approach to Improved Phone Reception, A (Rapp)	37, Apr.
Revamped Audio Circuit for Viking Transmitters (H & K)	39, July
Single-Sideband Economy (Technical Topics)	43, Mar.
120 Watts of Audio Without Driving Power (Grammer)	15, Dec.

BEGINNER

Basic Tool Kit for the Novice, A (McCoy)	40, Jan.
Beginner's Code-Practice Set, A (McCoy)	36, Feb.
Crystal Control on 220 Mc. (Tilton and Southworth)	16, Feb.
Examination Committees (editorial)	9, Sept.
Gadgets for the S-76 (McCoy)	44, Nov.
Getting the Most Out of Your Receiver (Goodman)	32, Jan.
How to Tune a Single-Sideband Signal (Goodman)	20, Aug.
Let's Go VFO (McCoy)	23, Apr.
Let's Meet Mr. Ionosphere (McCoy)	36, Aug.
Low-Cost Transistorized Code-Practice Oscillator, A (Hoisington)	24, June
Novices and DX (editorial)	9, Feb.

Principles of Radiotelephony, Some (Goodman) — Part I	37, May
Part II	13, June
Part III	34, July
Part IV	22, Oct.
Addendum	40, June
Selectivity and Phone Reception (Goodman)	20, Mar.
Step-by-Step Transmitter for the V.H.F. Man, A (Tilton and Southworth) — Part I	16, Oct.
Part II	41, Nov.
Technician Privileges (editorial)	9, Dec.
Technician Rig for 220 and 420 Mc. (Southworth)	27, Dec.
Tin Can Low-Pass, The (McCoy)	29, Sept.
Two-Dial Receivers and 100-Kc. Signals	34, Oct.
What's with Your Log? (McCoy)	32, Mar.
40 Watts on the 7- and 21-Mc. Bands (McCoy)	11, Dec.

CIVIL DEFENSE

CD-10-TC, The (Deane)	32, Nov.
Feed-back	146, Dec.
Civil Defense Control-Station Transmitter, A (Rand) — Part I	16, Aug.
Part II	33, Sept.
Communications in Civil Defense (Morris)	55, July
Off to the RACES (Garn)	69, Nov.
Simple 144-Mc. Rig for C.D. Work, A (Newland)	31, Feb.
1953 SET Shindig, The (Hart)	47, Apr.

COMMUNICATIONS DEPARTMENT

Affiliated-Club Class Instruction	70, June; 75, July
Affiliated-Club Honor Roll	69, June; 75, Dec.
Affiliated-Club Training Aids	64, Mar.; 73, Apr.; 77, July; 69, Aug.; 67, Sept.; 79, Nov.
ARRL Announces Traffic Medallions	64, Aug.
A1 Operator Club	77, May
BPL Multi-Operator Category, Announcement	67, Oct.
Code-Practice Stations	68, Jan.; 37, Feb.; 75, July; 75, Nov.
DX Century Club	60, Dec.
DXCC Notes	67, June; 73, July; 65, Aug.; 64, Nov.
Elections	62, Feb.; 71, Apr.; 65, June; 68, Aug.; 69, Oct.; 71, Dec.
Meet the SCMs	62, Mar.; 69, Aug.; 65, Sept.; 78, Nov.
Net Directory	78, Nov.
Supplement	67, Jan.; 63, Mar.; 81, May
WIAW Operating Schedule	79, May; 70, Sept.

CONSTRUCTION PRACTICES

Basic Tool Kit for the Novice, A (McCoy)	40, Jan.
Electric Fence Wire for Antenna Use (H & K)	55, Nov.
Etched Circuitry for the Ham — Now! (Middletan and Marshall)	21, Aug.
Homemade Guy-Wire Insulators (H & K)	54, Nov.
Homemade Holder for Surplus Radar Crystals (H & K)	140, Apr.
Invading Never-Never Land (Peters)	30, July
Make Your Own Potted Circuits (Baker and Moynahan)	16, July
Making Large Round Chassis Holes Without a Punch (H & K)	124, Feb.
Miniature Low-Loss Connectors (H & K)	63, Jan.
Mounting and Tapping B & W Miniductors (H & K)	48, Mar.
New Shielding Trick (H & K)	55, Nov.
Preventing R.F. Leaks with Aluminum Foil (H & K)	122, Feb.
Protecting Chassis Finish During Construction (H & K)	39, Sept.
Reducing Tank-Condenser Minimum Capacitance	29, July
Removing Hot Tubes (H & K)	39, Dec.
Repairing Ceramic or Isolantite Components (H & K)	54, Nov.
Rifle Cleaning Brush as a Soldering Aid (H & K)	122, Feb.
Shock Mount for Relays (H & K)	45, Feb.
Soldering to Aluminum (H & K)	42, June
More About	39, Sept.
Source of Sheet Aluminum (H & K)	63, Jan.
Starting Hard-to-Get-at Machine Screws and Nuts (H & K)	39, Dec.
Uses for Old Fluorescent Starters (H & K)	49, Apr.
Utilizing Burnt-Out Metal Tubes as Cable Plugs (H & K)	42, June

CONTESTS & OPERATING ACTIVITIES

All-Women's Transcontinental Air-Race Communications Report (YL News & Views)	47, Sept.; 65, Oct.
Armed Forces Day, Announcement	70, May
Results	52, Aug.
CD Party Results	70, Jan.; 69, Apr.; 73, July; 70, Oct.
Coast to Coast on 144 Mc.	62, Aug.
Communications in Civil Defense	55, July
Connecticut QSO Party	86, Oct.
DX Contest	
Announcing 20th ARRL DX Competition	37, Jan.; 39, Feb.
Preview of C.W. Scores	64, July
Preview of 'Phone Scores	54, June
Results	48, Oct.
Field Day	
1954 Rules	46, June
High Claimed Scores	65, Sept.
1954 Results	42, Dec.
Frequency Measuring Test	61, Feb.; 77, May; 67, Sept.; 72, Dec.
LABRE DX Contest	62, Sept.
Minnesota QSO Party	76, Sept.
Novice Round-up	52, June; 51, Dec.
Ohio QSO Party	82, Apr.
Ontario QSO Contest	112, Apr.
Radioletter SS	77, May; 70, Dec.
Roadside Division Party	106, Dec.
Rocky Mountain Division QSO Party	106, May
Simulated Emergency Test of 1953 (Hart)	47, Apr.
Announcement, 1954	72, Oct.
Sweepstakes	
High Claimed Scores, 1953	57, Feb.
Final Results, 1953	58, May
Announcement, 1954	26, Oct.; 48, Nov.
Vermont QSO Party	94, Apr.
VE/W Contest	120, Feb.; 50, Sept.
V.H.F. QSO Party	
Sept., 1953, Results	49, Jan.
June Announcement	61, June
June Results	54, Sept.
September Announcement	50, Sept.
Virginia QSO Party	104, May
VK/ZL DX Contest	62, Sept.
West Virginia QSO Party	90, Mar.
Wisconsin Section QSO Party	79, Dec.
YLRL 14th Anniversary Party Results	51, Apr.
YLRL 15th Anniversary Party	58, Nov.
5th Annual YL-OM Contest	50, Mar.; 49, June
7th V.H.F. Sweepstakes	52, Jan.
Results	59, Apr.
160-Meter DX Tests	64, Jan.; 65, Dec.

CONVENTIONS

Dakota Division	50, Aug.; 10, Sept.
Midwest Division	10, Oct.
New England Division	10, Oct.
Oregon State	50, June
Pacific Division	50, June
Roadside Division	10, Oct.
Rocky Mountain Division	102, Apr.; 36, May
Southeastern Division	50, June
West Gulf Division	10, Sept.

EDITORIALS

Amateur Growth	9, Apr.
ARRL's 40th Anniversary	9, May
Examination Committees	9, Sept.
Hurricane Operations	9, Nov.
It's Our Job, Now	9, June
ITV	9, Aug.
League Elections	9, Sept.
Licence Fees	9, Feb.
Mail Exam Practices	9, July
Membership Growth	9, Apr.
Non-Amateur Interference in Ham Bands	9, Mar.
Novices and DX	9, Feb.
QST, Volume I	9, Oct.
Single Sideband	9, Oct.
Sterling Retires	9, Nov.
Technician Privileges	9, Dec.
TVI Checking	9, Apr.
Year in Review, The	9, Jan.

EMERGENCIES & EXPEDITIONS

AREC, With the (Operating News)	
Anderson, Ind., Tornado	67, June
Chesterton, Md., Fireworks Plant Explosion	68, Oct.
Clayton and LaFargeville, N. Y., Storm	66, June
Dallas, Texas, Crime Wave	58, Feb.
Deer Lodge, Mont., Highway Accident	76, Nov.
Des Moines, Iowa, Flood	66 Sept.; 76, Nov.
Grand Caymans Forced Aircraft Landing	58, Feb.
Harrisburg, S. Dak., Tornadoes	76, Nov.
Hart Mt., Ore., Fire	74, Dec.
Haverhill, Mass., Storm	68, Oct.
Indiana-Illinois Rainstorm	74, Dec.
Indiana Tornado	58, Feb.
Kansas Snow, Ice and Dust Storms	78, May
Kentucky-Tennessee Snowstorm	66, June
Kentucky-West Virginia Snowstorm	67, June; 74, July
Lake Superior Storm	66, Jan.
Lynn, Mass., Flash Flood	66, Aug.
Macon, Ga., Airport Communications Disruption	70, Apr.
Milwaukee, Wisc., Rainstorm	66, Sept.
Minnesota Sleet Storm	58, Feb.
Montana Aircraft Accidents	74, July; 66, Aug.; 74, Dec.
New Jersey Highway Accident	66, Jan.
Ontario Blizzard	67, June
Oregon Snow and Rainstorm	78, May
Ozama, Texas, Flood	76, Nov.
Scarboro Township, Ont., Kidnapping	66, June
Sibley, Iowa, Sleet Storm	60, Mar.
Sidney, N. Y., Rainstorm	66, Sept.
South Dakota Sleet Storm	60, Mar.; 67, June
Southern California Earthquake	67, June
Spokane, Wash., Railway Communications Disruption	74, July
Texas B-36 Crash	61, Mar.
Texas Forest Fires	68, Oct.
Utah Aircraft Search	66, Sept.
Vicksburg, Miss., Tornado	61, Mar.
Warner Robins, Ga., Tornado	66, June
Westfield, Mass., Fire	77, Nov.
West Virginia Forest Fires	60, Mar.
Zion, Ill., Fire	78, May
DX-pedition to Clipperton (Denniston)	11, July
Hurricane Operations (editorial)	9, Nov.
Operation Alert	72, Dec.

FEATURES & FICTION

DX-pedition to Clipperton (Denniston)	16, July
FCC Visits ARRL Hq.	10, Mar.
Fulminatin's from Of Foggy	34, Nov.
Hammhacks (Middleton)	48, Sept.
QST—Volume I (Young)	40, Oct.

HAPPENINGS OF THE MONTH

Amateur Radio Week Proposed	44, Apr.
Amateur Week in Indiana and Michigan	47, Aug.
Antenna Mast Okayed	32, June
Austrian Ban Off	33, June
Board Meeting	52, May
Board Meeting Highlights	32A, June
Board Meeting Minutes	45, July
Call Sign Requests Denied	53, Dec.
Canadian Regs Changes	45, July
Conelrad Plan Approved	46, Aug.
Director Elections	50, Nov.
Docket 9288 Filing	146, Dec.
Docket 10712 Filing	43, Feb.
Docket 10927 Filing	47, Aug.
Edward A. Roberts, W3HC	33, June
Election Injunction Again Denied	44, July
Election Injunction Denied	44, Apr.
Election Injunction Sought	30, Jan.
Election Notice	46, Aug.; 44, Sept.
Election Results	30, Jan.
Exam Points Change	31, Jan.
Examination Schedule	31, Jan.; 44, July
Executive Committee Meetings	120, Aug.
FCC Denies Voice Expansion — Opens 6-Meter Duplex	41, Oct.
FCC Proposals	45, Apr.
General Class Exam Scope Expanded	53, Dec.
Grammer's 25th	41, Oct.

"ITV" Filing	146, Dec.
K4 Calls Being Issued	50, Nov.
League Audits	44, Sept.
League Opposes License Fee	54, May
License Fees Deferred	45, July
License Fees Proposed	44, Mar.
License Plates	84, May
Mail License Procedures	50, Nov.
Maritime Mobile Hearing	43, Feb.
National Amateur Radio Week	53, May
New Hams at Hq.	52, Dec.
New Security Rules	46, Aug.
Novice Expansion Proposed	40, Oct.
Novice & Technician Changes	52, May
Ohio Amateur Radio Week	45, Sept.
QST Article Awards	52, May
Recent Commission Actions	50, Nov.
Renewal Form 405-A	52, Dec.
Security Rules	45, Sept.
Sideband Segregation Denied	52, Dec.
Special Ronoke Election	50, Nov.
Spurious-Radiation Problems	31, Jan.
Staff Notes	44, Apr.
Technician Expansion Proposed	41, Oct.
TVI Show to West Coast	45, Apr.
W6ZH Chosen Undersecretary of State	40, Oct.
Walter E. Bradley, W1FWH	53, Dec.
What Bands Available?	51, Nov.
3.5-Mc. Pacific Use	47, Aug.
21-Mc. MM Granted	33, June

HINTS & KINKS

January, page 63	
Subband Markings for HRO Coils (Engwicht)	
Stow Clamp for Mobile Antennas (Kovacevich)	
Source of Sheet Aluminum (Witt)	
Miniature Low-Loss Connectors (Pearre)	
More About the Grid-Plate Oscillator (Jeffrey)	
February, page 45	
Shock Mount for Relays (Davis)	
Grid-Dip Meter as an Aid to Crystal Grinding, The (Kujampaa)	
Preventing R.F. Leaks with Aluminum Foil (Forant)	
Rifle Cleaning Brush as a Soldering Aid (Detmer)	
Handy Storage Bins (Blaisdell)	
Making Large Round Chassis Holes Without a Punch (Crane)	
March, page 48	
More About Generator Noise (Stuckey)	
Mounting and Tapping B & W Miniductors (CP1BK)	
Suppression of Auto-Gauge Interference (Thomason)	
April, page 49	
Uses for Old Fluorescent Starters (Solomon)	
Using the Meisner Type EX Signal Shifter at 1.8 Mc. (Anderson)	
Homemade Holder for Surplus Radar Crystals (Bruno)	
May, page 42	
Test-Lead Storage (Brugh)	
I.F. Transformer for the "Good Four-Tube Superhet" (Kelley)	
June, page 42	
Double Conversion Using the BC-348 (Ditton)	
Double-Duty Relay Service (Kleban)	
Crystal Socket Hint (Unterkofer)	
Utilizing Burnt-Out Metal Tubes as Cable Plugs (Baghdasarian)	
Soldering to Aluminum (Orloski)	
July, page 39	
V.T.V.M. Power Supply for the G.D.O. (McCloud)	
Earphone Pads (Messler)	
Revamped Audio Circuit for Viking Transmitters (Seeley)	
Source of Hum in Old Receivers (Dilno)	
August, page 42	
Low-Voltage Regulation (Fernane)	
Feed-back	136, Oct.
Color-Code Reminder (Williams)	
Using 12-Volt Dynamotors with 6-Volt Charging Systems (Matthews)	
September, page 39	
More About Soldering Aluminum (Woodward)	
Notemov Selectivity Control for the Collins 75A-3 (West-Aichola)	
Removing Pilot Lamps (Terrill)	
Protecting Chassis Finish During Construction (Kosina)	
November, page 54	
Homemade Guy-Wire Insulators (Chrast)	
Power-Supply Hint (Collins)	
Simple Continuity Tester (Terrill)	
Handy Mounting for the Neon Bulb (Beers)	

Repairing Ceramic or Lualite Components (Greenberg)	
Curing Regeneration in the Bandswitching Kilowatt (Bridges)	
QST Article Indexing Hint (Stouth)	
Electric Fence Wire for Antenna Use (Brown)	
Homemade QSL Cards (Hart)	
New Shielding Trick (Carpenter)	
Novel Direction Indicator for Rotary Beams, A (Gross)	
Modulating the Grid-Dip Oscillator (Deane)	
December, page 39	
Starting Hard-to-Get-at Machine Screws and Nuts (Joseph; Kosina)	
"All-Band" Antenna (Cope)	
Using the Select-O-Ject as a Keying Monitor (Bakersmith)	
Removing Hot Tubes (McCoy)	

I.A.R.U. NEWS

Austria	63, Sept.
December Calendar	58, Dec.
June Calendar	63, Sept.
Philippines	63, Sept.
QSL Bureau Changes	63, Sept.
QSL Bureaus of the World	59, June; 58, Dec.
WAC Boundary Change	63, Sept.

KEYING & CONTROL CIRCUITS

Application of the Characteron as a Morse-Code Converter, The (McNaney and Jackson)	16, Mar.
Beginner's Code-Practice Set, A (McCoy)	36, Feb.
Break-In with One Antenna (Puckett)	35, Mar.
Double-Duty Relay Service (H & K)	42, June
Low-Cost Transistorized Code-Practice Oscillator, A (Hosington)	24, June
"Paratone" — An R.F.-Powered Monitor for Break-In, The (Klein and Slusher)	25, Aug.
Protective Circuit for Transmitting Tetrodes, A (Beling)	33, Oct.
Simplified "Break-In with One Antenna" (Crawfis)	30, Nov.
Thyratron-Controlled Electronic Key, A (Gallagher)	24, Dec.
Transistor Self-Powered C.W. Monitor, A (Klein and Slusher)	28, Jan.
Feed-back	10, Apr.
"Tur-Key" in Miniature, The (Turrin)	11, Sept.
Using the Select-O-Ject as a Keying Monitor (H & K)	39, Dec.
VR Break-In Keying (Goodman)	33, Feb.

MEASUREMENTS & TEST EQUIPMENT

Checking R.F. Chokes with the G.D.O. (Johnson)	15, Feb.
Distortion in Single-Sideband Linear Amplifiers (Bruene)	24, Nov.
Dual Regulated General-Purpose Power Supply (Hansen)	20, Dec.
Grid-Dip Meter as an Aid to Crystal Grinding, The (H & K)	45, Feb.
Handy Mounting for the Neon Bulb (H & K)	54, Nov.
Lazy Man's Panoramic Adapter, The (Ehrlich)	14, Nov.
Modulating the Grid-Dip Oscillator (H & K)	56, Nov.
Principal Characteristics of Standard-Frequency and Time-Signal Stations (Strays)	54, Apr.
Scope Intensifier (On the Air with Single Sideband)	112, Mar.
Simple Continuity Tester (H & K)	54, Nov.
Test-Lead Storage (H & K)	42, May
Transient Demonstrator, A (Rumble)	46, Nov.
TVI Checking at Headquarters	34, Apr.
Two-Dial Receivers and 100-Kc. Signals	34, Oct.
Using the B.F.O. as an Interpolation Oscillator (Campbell)	31, Dec.
Vacuum-Tube Insulation-Resistance Tester, A (Kosa)	42, Feb.
V.T.V.M. Power Supply for the G.D.O. (H & K)	39, July
WWV-WVH Schedules	34, Jan.; 110, June; 73, Nov.
50-Kc. Markers from a 100-Kc. Crystal	40, July

MISCELLANEOUS — GENERAL

Earphone Pads (H & K)	39, July
FCC Visits ARRL Hq.	10, Mar.
Handy Storage Bins (H & K)	122, Feb.
Homemade QSL Cards (H & K)	55, Nov.
New Books	47, Jan.; 62, July; 130, Aug.
Novice & Technician Exams by Mail	51, May
Public Relations Project, A (Archer)	18, Nov.
QST — Volume I (Young)	40, Oct.
(See also "It Seems to Us" . . . same issue)	

QST Article Indexing Hint (H & K)	55, Nov.
Switch to Safety	72, Oct.
Transmitter Hunting with the D.F. Loop (Norberg)	33, Apr.
W9NZZ Wins Edison Award	16, Apr.

MISCELLANEOUS — TECHNICAL

Application of the Character as a Morse Code Converter, The (McNaney and Jackson)	16, Mar.
Build Your Own Panoramic Adapter (Priebe)	20, Sept.
Circuit Diagrams (Technical Correspondence)	114, Mar.
Circuit Diagrams (Technical Topics)	42, Jan.
Circuit Symbol for the Junction-Type Transistor (Technical Topics)	36, Oct.
Color-Code Reminder (H & K)	42, Aug.
Crystal-Socket Hint (H & K)	42, June
Extending the Range of the ARRL Lightning Calculator (Beers; Bradley)	40, Sept.
Low-Voltage Regulation (H & K)	42, Aug.
Feed-back	136, Oct.
New Apparatus & Recent Equipment	47, Jan.; 52, Feb.; 47, May; 43, June; 43, July; 43, Aug.; 42, Sept.; 56, Sept.; 38, Oct.; 40, Dec.
Removing Pilot Lamps (H & K)	39, Sept.
Sunspots Just Around the Corner? (Technical Topics)	53, Aug.

MOBILE

Bandpass Circuit Design for Crystal-Controlled Converters (Hadlock)	27, Feb.
Checks on 10-Meter Mobile Whip, Some (Plummer and Seidel)	34, Aug.
Have You Tried V.H.F. Mobile? (Tilton)	16, Sept.
"Mighty Mo" Gets Mightier (Mouradian)	34, May
Mobile Loop Antennas (Webster)	26, June
More About Generator Noise (H & K)	48, Mar.
R.F. Assembly for Mobile or Fixed-Station Work (Chambers)	11, Oct.
Feed-back	10, Nov.
Simple Crystal-Controlled Converters (Deane)	34, Dec.
Stop Clamp for Mobile Antennas (H & K)	63, Jan.
Suppression of Auto-Gauge Interference (H & K)	48, Mar.
Transmitter Hunting with the D.F. Loop (Norberg)	33, Apr.
Twenty-Five Watts Under the Dash (Lamb)	10, Aug.
Unusual 75-Meter Mobile Antenna, An (Haughton)	23, Jan.
Using 12-Volt Dynamotors with 6-Volt Charging Systems (H & K)	42, Aug.

MODULATION

A.M. Equivalent of Single Sideband, The (Grammer)	19, Jan.
Delay-Line Phase Shift (Griffin and Fryklund)	12, Mar.
Distortion in Single-Sideband Linear Amplifiers (Bruene)	24, Nov.
Phase-Modulation Exciter for the V.H.F. Man (Southworth)	39, Aug.
Post-Phasing Distortion (Technical Topics)	40, Feb.
Principles of Radiotelemetry, Some (Goodman) — Part I	37, May
Part II	13, June
Part III	34, July
Part IV	22, Oct.
Addendum	40, June
Single-Sideband Economy (Technical Topics)	43, Mar.
120 Watts of Audio Without Driving Power (Grammer)	15, Dec.

POWER SUPPLY

Dual Regulated General-Purpose Power Supply (Hansen)	20, Dec.
Power-Supply Hint (H & K)	54, Nov.

RECEIVING

Adding a Mechanical Filter to the 75A-1 (Andrew)	35, Jan.
Bandpass Circuit Design for Crystal-Controlled Converters (Hadlock)	27, Feb.
Broad-Band Bandswitching Converter/Preselector (Latter)	25, Sept.
CD-10-TC, The (Deane)	32, Nov.
Feed-back	146, Dec.
Cascaded Half-Lattice Crystal Filters for 'Phone and C.W. Reception (Morrison)	21, May
Crystal-Controlled Converter for 432 Mc., A (Tilton)	24, Jan.
Crystal-Controlled Converter for 21 Mc., A (Tilton)	29, Mar.

Double-Conversion Attachment for 2-Meter Receivers (Bretfelder)	32, Dec.
Double Conversion Using the BC-348 (H & K)	42, June
Gadgets for the S-76 (McCoy)	44, Nov.
Getting the Most Out of Your Receiver (Goodman)	32, Jan.
Have You Tried V.H.F. Mobile? (Tilton)	16, Sept.
How To Tune a Single-Sideband Signal (Goodman)	20, Aug.
I.F. Transformer for the "Good Four-Tube Superhet" (H & K)	42, May
Invading Never-Never Land (Peters)	30, July
Lazy Man's Panoramic Adapter, The (Ehrlich)	14, Nov.
Modifying the S-40 for S.S.B. Reception (Sommerfeld)	42, Apr.
Feed-back	130, May
Notes on Selectivity Control for the Collins 75A-3 (H & K)	39, Sept.
One-Package Station for Two Meters, A (Southworth)	11, Apr.
Feed-back	118, June
'Phone Selectivity for the BC-312 (Morrison)	19, Feb.
Radical Approach to Improved 'Phone Reception, A (Rapp)	37, Apr.
R.F. Amplifiers for 420 Mc. Using the 6AN4 (Lee and Loofbourrow)	39, Mar.
Receiver for Flat Purses, A (Hayward)	34, June
Selectivity and 'Phone Reception (Goodman)	20, Mar.
Sideband Filters Using Crystals (Burns)	35, Nov.
Simple Crystal-Controlled Converters (Deane)	34, Dec.
Source of Hum in Old Receivers (H & K)	134, July
Subband Markings for HRO Coils (H & K)	63, Jan.
Transistor Superregenerative Receiver for 10 and 6 Meters, A (Wadsworth)	17, Nov.
Two-Dual Receivers and 100-Kc. Signals	34, Oct.
Using the B.F.O. as an Interpolation Oscillator (Campbell)	31, Dec.
Using the Select-O-Ject as a Keying Monitor (H & K)	39, Dec.

REGULATIONS

(Also see "Happenings of the Month")

Antenna Mast Okayed	32, June
Austrian Ban Off	33, June
Call Sign Requests Denied	53, Dec.
Canadian Regn. Changes	45, July
Conrad Plan Approved	46, Aug.
FCC Denies Voice Expansion — Opens 6-Meter Duplex	41, Oct.
New Security Rules	46, Aug.
Novice & Technician Changes	45, Sept.
Novice & Technician Exams by Mail	52, May
Recent Commission Actions	51, May
Renewal Form 405-A	50, Nov.
Sideband Segregation Denied	52, Dec.
What's with Your Log? (McCoy)	32, Mar.
3.5-Mc. Pacific Use	47, Aug.
21-Mc. MM Granted	33, June

SINGLE SIDEBAND

A.M. Equivalent of Single Sideband, The (Grammer)	19, Jan.
Case for the AB1 Linear, The (Grammer)	26, Apr.
Delay-Line Phase Shift (Griffin and Fryklund)	12, Mar.
Distortion in Single-Sideband Linear Amplifiers (Bruene)	24, Nov.
Fine Tuning with a Clapp Oscillator (On the Air with Single Sideband)	38, Feb.
How To Tune a Single-Sideband Signal (Goodman)	20, Aug.
Modifications of "W9LJ" Anti-Trip Voice Control (On the Air with Single Sideband)	38, Feb.
Modifying the S-40 for S.S.B. Reception (Sommerfeld)	42, Apr.
Feed-back	130, May
Post-Phasing Distortion (Technical Topics)	40, Feb.
Resistance-Coupled Buffer for Stabilizing a 6AG7 (On the Air with Single Sideband)	39, Feb.
'Scope Intensifier (On the Air with Single Sideband)	112, Mar.
Selectable Sideband with VFO and a Filter-Type Generator (On the Air with Single Sideband)	46, Jan.
Sideband Filters Using Crystals (Burns)	35, Nov.
Single Sideband (editorial)	9, Oct.
Single-Sideband Economy (Technical Topics)	43, Mar.
Still More on Moving Crystal Frequencies (On the Air with Single Sideband)	112, Mar.
Tubeless VFO for the 10A, A	28, June
Re the	30, Oct.
Using the Viking I with a Crystal-Filter Exciter (On the Air with Single Sideband)	34, Mar.
Using the Viking II as a Linear Amplifier (On the Air with Single Sideband)	46, Jan.
813a in a High-Power Linear (Simon)	20, July

TRANSMITTERS

Bandwidthing 813 Rig with Pi-Section Output, A (Reconin)	16, June
CD-10-TC, The (Deane)	32, Nov.
Feed-back	146, Dec.
Civil Defense Control-Station Transmitter, A (Rand) — Part I	16, Aug.
Part II	33, Sept.
"Connecticut Kilowatt," The (Reconin)	30, Aug.
Crystal Control on 220 Mc. (Tilton and Southworth)	16, Feb.
High-Power Pi-Network Amplifier with Parallel Tetrodes (Bridges)	13, May
Low-Cost Gallon, A (Anthony)	31, Sept.
"Mighty Mo" Gets Mightier (Mouridian)	34, May
Notes on Grounded-Grid R.F. Power Amplifiers (Puckett)	36, Dec.
One-Package Station for Two Meters, A (Southworth)	11, Apr.
Feed-back	118, June
Phase-Modulation Exciter for the V.H.F. Man (Southworth)	39, Aug.
Piggy Powerhouse, The (Countryman)	17, Apr.
R.F. Assembly for Mobile or Fixed-Station Work (Chambers)	11, Oct.
Feed-back	10, Nov.
Simple 144-Mc. Rig for C.D. Work, A (Newland)	31, Feb.
Step-by-Step Transmitter for the V.H.F. Man, A (Tilton and Southworth) — Part I	16, Oct.
Part II	41, Nov.
Supplementary Data on the Three-Control 813 Transmitter (Chambers)	37, June
Technician Rig for 220 and 420 Mc. (Southworth)	27, Dec.
Three-Control Six-Band 813 Transmitter (Chambers)	11, Jan.
Twenty-Five Watts Under the Dash (Lamb)	10, Aug.
40-Watt Amplifier for 220 Mc., A (Tilton)	18, May
40 Watts on the 7- and 21-Mc. Bands (McCoy)	11, Dec.
813s in a High-Power Linear (Simon)	20, July

TRANSMITTING

Amplitude Limiting for the VFO (Bernstein)	24, Feb.
Audio for the Mobile or Fixed-Station R.F. Assembly (Chambers)	21, Nov.
Feed-back	146, Dec.
Bandspreading the Clapp VFO (Russell)	37, Oct.
Case for the AB Linear, The (Grammer)	26, Apr.
Curing Regeneration in the Bandwidthing Kilowatt (H & K)	55, Nov.
Delay-Line Phase Shift (Griffin and Fryklund)	12, Mar.
Distortion in Single-Sideband Linear Amplifiers (Brucne)	24, Nov.
Fine Tuning with a Clapp Oscillator (On the Air with Single Sideband)	38, Feb.
Have You Tried V.H.F. Mobile? (Tilton)	16, Sept.
Let's Go VFO (McCoy)	23, Apr.
Modifications of "W9LJ" Anti-Trip Voice Control (On the Air with Single Sideband)	38, Feb.
More About the Grid-Plate Oscillator (H & K)	63, Jan.
Multiband 813 Final, A (Rinaudo)	11, Nov.
Multiband Tuning Circuits (Johnson)	25, July
Notes on Grounded-Grid R.F. Power Amplifiers (Puckett)	36, Dec.
Post-Phasing Distortion (Technical Topics)	40, Feb.
Protective Circuit for Transmitting Tetrodes, A (Beling)	33, Oct.
Putting the Collins 32-V on 160 (Zelle)	38, Apr.
R.F. Chokes for High-Power Parallel Feed (Chambers)	30, May
Reducing Tank-Condenser Minimum Capacitance	29, July
Resistance-Coupled Buffer for Stabilizing a 6AG7 (On the Air with Single Sideband)	39, Feb.
Selectable Sideband with VFO and a Filter-Type Generator (On the Air with Single Sideband)	46, Jan.
Sideband Filters Using Crystals (Burns)	35, Nov.
Simplified "Break-In with One Antenna" (Crawfis)	30, Nov.
Single-Ended Multiband Tuners (Chambers)	23, July
Single-Sideband Economy (Technical Topics)	43, Mar.
Still More on Moving Crystal Frequencies (On the Air with Single Sideband)	112, Mar.
Tin Can Low-Pass, The (McCoy)	29, Sept.
Tubeless VFO for the 10A, A	28, June
Re the	30, Oct.

Using the Meissner Type EX Signal Shifter at 1.8 Mc. (H & K)	49, Apr.
Using the Viking I with a Crystal-Filter Exciter (On the Air with Single Sideband)	34, Mar.
Using the Viking II as a Linear Amplifier (On the Air with Single Sideband)	46, Jan.
50-Mc. TVI — Its Causes and Cures (Ladd) — Part I	21, June
Part II	32, July
120 Watts of Audio Without Driving Power (Grammer)	15, Dec.

TVI

ITV (editorial)	9, Aug.
"ITV" Filing (Happenings of the Month)	146, Dec.
On the TVI Front	
ARRL TVI Demonstration Visits Dallas	57, Dec.
Cure for ITV	46, Sept.
Encouraging Letter	57, Dec.
Licking U.H.F. Strip TVI — A Success Story	28, Mar.
Raytheon Advises Consumers on TVI	31, June
Reminder — Television Script on TVI Available	28, Mar.
TVI Committee Operation Described	46, Sept.
Up-to-Date List of TVI Committees	31, June
21-Mc. TVI	57, Dec.
Preventing R.F. Leaks with Aluminum Foil (H & K)	122, Feb.
Progress and Activities Report — Washington TVI Committee (Richman)	52, July
Standing Waves and TVI (Technical Topics)	44, Jan.
Tin Can Low-Pass, The (McCoy)	29, Sept.
TVI Checking (editorial)	9, Apr.
TVI Checking at Headquarters	34, Apr.
TVI "Diplomatic" (Rowe and Lake)	30, June
TVI Show to West Coast (Happenings of the Month)	45, Apr.
TV Receiver Radiation (Najork) (Technical Correspondence)	57, Nov.
50-Mc. TVI — Its Causes and Cures (Ladd) — Part I	21, June
Part II	32, July

V.H.F. & MICROWAVES

Civil Defense Control-Station Transmitter, A (Rand) — Part I	16, Aug.
Part II	33, Sept.
Coast to Coast on 144 Mc.	62, Aug.
Crystal Control on 220 Mc. (Tilton and Southworth)	16, Feb.
Crystal-Controlled Converter for 432 Mc., A (Tilton)	24, Jan.
Double-Conversion Attachment for 2-Meter Receivers (Bretzfelder)	32, Dec.
Have You Tried V.H.F. Mobile?	16, Sept.
New Record on 10,000 Mc.	10, June
One-Package Station for Two Meters, A (Southworth)	11, Apr.
Feed-back	118, June
Phase-Modulation Exciter for the V.H.F. Man (Southworth)	39, Aug.
R.F. Amplifiers for 420 Mc. Using the 6AN4 (Lee and Loofbourrow)	39, Mar.
Simple 144-Mc. Rig for C.D. Work (Newland)	31, Feb.
Step-by-Step Transmitter for the V.H.F. Man, A (Tilton and Southworth) — Part I	16, Oct.
Part II	41, Nov.
Technician Rig for 220 and 420 Mc. (Southworth)	27, Dec.
Transistor Superregenerative Receiver for 10 and 6 Meters, A (Wadsworth)	17, Nov.
World Above 50 Mc., The	
Atlanta, Ga., C.D. Antennas for 144 Mc.	57, A r.
Coat-Hanger Antenna Elements	68, Nov.
Feeding Stacked Arrays with Coaxial Line	62, Aug.
Horizontal Polarization and 2-Meter Mobile	55, Jan.
R.F. Amplifier Hints	63, June
432-Mc. Converter Ideas (W5NSJ)	66, Nov.
6252 and 6300, New Twin Tetrodes	55, Feb.
6360 Tripler for 423 Mc.	67, Nov.
6524, New U.H.F. Twin-Tetrode	136, Oct.
40-Watt Amplifier for 220 Mc., A (Tilton)	18, May
50-Mc. TVI — Its Causes and Cures (Ladd) — Part I	21, June
Part II	32, July

SINGLE SIDEBAND SELECTOR #2

JUDGING from the comments on the air and the letters we have received, the page I wrote for the October issue of *QST* touched on a delicate subject. To clear up some of the misunderstandings, we would like to make the following statements:

1. The purpose of the tests was to determine the feasibility of incorporating selectable sideband in new receiver designs where reception of *double sideband AM signals* is a consideration.
2. The fact that our test indicated better readability with the crystal filter does not mean that we will not consider the use of selectable sideband since reception of SSSC signals is another important consideration.
3. The Single Sideband converter used for the tests is not available to Amateurs. It is a recent development for the military service. No single sideband converter *presently in production* for the Amateur market was tested.
4. The signals were clean, without evidence of frequency modulation.
5. The reception with the crystal filter was essentially exalted carrier selectable sideband, with the characteristics of the crystal supplying the peak to exalt the carrier and the notch to reject the undesired sideband. See page 65 of the February 1954 issue for the tuning details necessary to produce these results.
6. Our point was this: In the purchase of an NC-183D or HRO-60 receiver, a means of carrier exaltation and sideband selection of *double sideband AM signals* is built in if the time is taken to get familiar with it.
7. It does not necessarily follow that this performance will be obtained with all receivers containing crystal filters since there are other considerations.
8. All the operators used in making the test were thoroughly familiar with the equipment and the problem.

Since the last discussion of selectable sideband, I have had the pleasure of using a SSSC exciter at my home QTH. To say that I am enthused is putting it mildly — even twenty CW was omitted from my operating schedule last weekend. This is something coming from a DX hound.

National Company has expanded its activities which includes a program of more diversified Amateur products. This will include in addition to new equipment, a larger selection of components designed for the constantly changing market.

Certainly Single Sideband equipment and components will be among the new items.

ED HARRINGTON, W1JEL

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RCA High-Perveance tubes—power triodes and beam power types—are available at your RCA Tube Distributor. For technical data write RCA, Commercial Engineering, Section L37M, Harrison, N. J.

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RCA No.	Type	DC Plate Input (watts)	DC Plate Volts
2E26	Beam Power	40	600
807	Beam Power	75	750
810	Triode	750	2500
811A	Triode	260	1500
812A	Triode	260	1500
813	Beam Power	500	2250
815	Twin Beam Power	75*	500
829B	Twin Beam Power	120*	750
832A	Twin Beam Power	50*	750
833A	Triode	1000	3300
5763	Beam Power	17	350
6146	Beam Power	90	750
6524	Twin Beam Power	85	600
8000	Triode	750	2500
8005	Triode	300	1500

*Total for tube



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